



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
BIN C15700
Seattle, WA 98115-0070

January 30, 2002

Ken S. Berg
U.S. Department of the Interior
Fish and Wildlife Service
Western Washington Office
510 Desmond Drive SE
Lacey, Washington 98503

Attention: Alisa Ralph

Re: Biological Opinion on U.S. Fish and Wildlife Service's Programmatic Consultation for
Habitat Restoration Activities in Washington. FWS X-REF 1-3-99-FW-0538
(WSB-99-084)-PBO

Dear Mr. Berg:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion (Opinion) concluding formal Endangered Species Act consultation on U.S. Fish and Wildlife Service (FWS) Habitat Restoration activities in Washington as described in the FWS biological assessment (BA) dated April 10, 2001. This Opinion addresses Snake River sockeye salmon (*Oncorhynchus nerka*); Ozette Lake sockeye salmon (*O. nerka*); Snake River spring/summer chinook salmon (*O. tshawytscha*); Snake River fall chinook salmon (*O. tshawytscha*); Puget Sound chinook salmon (*O. tshawytscha*); Lower Columbia River steelhead (*O. mykiss*); Upper Columbia River steelhead (*O. mykiss*); Snake River steelhead (*O. mykiss*); Upper Willamette River steelhead (*O. mykiss*); Middle Columbia River steelhead (*O. mykiss*); Columbia River chum salmon (*O. keta*); Hood Canal Summer-run chum salmon (*O. keta*); Lower Columbia River chinook salmon (*O. tshawytscha*); Upper Willamette River chinook salmon (*O. tshawytscha*); Upper Columbia River Spring-run chinook salmon (*O. tshawytscha*). Lower Columbia River/Southwest Washington coho salmon (*O. kisutch*), a candidate species, has also been considered in this opinion.

The NMFS has determined that the proposed action is not likely to jeopardize the continued existence of the listed species described above or adversely modify designated critical habitat. An Incidental Take Statement provides non-discretionary terms and conditions to minimize the potential for incidental take of listed species.



In addition, this document also serves as consultation on Essential Fish Habitat for coho and chinook salmon under the Magnuson-Stevens Act and its implementing regulations (50 CFR Part 600).

We appreciate the considerable effort and cooperation provided by your staff in completing this consultation. If you have any questions regarding this Opinion, please contact Dan Guy at (360) 534-9342 or my staff in the Washington State Branch Office.

Sincerely,

A handwritten signature in cursive script that reads "Michael R. Crouse". To the left of the signature is a small, stylized mark that appears to be "f.v."

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

Programmatic Biological Opinion

**U.S. Fish and Wildlife Service
Habitat Restoration Activities
(WSB-99-084)**

Agency: U. S. Fish and Wildlife Service;
Western Washington Office,
Upper Columbia River Basin Office,
Moses Lake Fish and Wildlife Office,
Mid-Columbia River Basin Fisheries Resource Office

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region
Washington State Habitat Branch

Issued by *f.i.* *Michael R Crouse*
D. Robert Lohn
Regional Administrator

Date Issued: 2/07/2002

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I. BACKGROUND AND DESCRIPTION OF PROPOSED PROJECT

A. Background

The US Fish and Wildlife Service (FWS) originally submitted a draft biological assessment (BA) for restoration activities to the National Marine Fisheries Service (NMFS) in 1999. In September of 2000, NMFS requested that the category of “streambank stabilization” be removed from the programmatic document. On March 16, 2001, NMFS received the Final Programmatic Biological Assessment for Habitat Restoration Activities in the FWS’s Western Washington Office, Upper Columbia Fish and Wildlife Office, Eastern Washington Ecological Services Office and Mid-Columbia River Basin fisheries Resource Office. The programmatic biological assessment (PBA) only covers restoration activities of these offices in Washington State. On April 10th NMFS concurred with the effects determinations for NMFS’ listed species and entered into formal consultation with the FWS.

The PBA described the FWS’ determination that some of the proposed activities would be “likely to adversely affect” anadromous fish species listed under the ESA. Species considered in this biological opinion (Opinion) are: Snake River sockeye salmon (*Oncorhynchus nerka*); Ozette Lake sockeye salmon (*O. nerka*); Snake River spring/summer chinook salmon (*O. tshawytscha*); Snake River fall chinook salmon (*O. tshawytscha*); Puget Sound chinook salmon (*O. tshawytscha*); Lower Columbia River steelhead (*O. mykiss*); Middle Columbia River steelhead (*O. mykiss*); Upper Columbia River steelhead (*O. mykiss*); Snake River steelhead (*O. mykiss*); Columbia River chum salmon (*O. keta*); Hood Canal Summer-run chum salmon (*O. keta*); Lower Columbia River chinook salmon (*O. tshawytscha*); Upper Columbia River Spring-run chinook salmon (*O. tshawytscha*). Lower Columbia River/Southwest Washington coho salmon (*O. kisutch*), a candidate species, has also been considered in this biological opinion (Opinion).

The FWS’ Division of Ecological Services funds several programs that support habitat restoration activities in Washington State. These Programs are:

- the Chehalis Fisheries Restoration Program;
- the Jobs in the Woods Program;
- the Partners for Fish and Wildlife Program;
- the Puget Sound Program; and,
- the Washington State Ecosystems Conservation Program

Each of the above listed programs funds projects in different geographic areas, has different criteria for approving projects, or receives its funding allocations from different funding sources. All, however, provide funding to complete habitat restoration projects in Washington State. It is appropriate to clarify the use of the term “habitat restoration.” In the PBA projects funded and carried out under FWS oversight may include habitat conservation/protection through fee access. Projects may include improving existing degraded habitat function without fully restoring to a

pre-impacted condition. Habitat rehabilitation might be a more appropriated term. Enhancement measures may also be included in project designs. The phraseology “habitat restoration” is used throughout this document to be inclusive of all of the above categories.

The objective of this Opinion is to programmatically determine whether the described restoration activities along with prescribed conservation measures, when constructed throughout the State of Washington, will jeopardize listed species or destroy or adversely modify the designated critical habitat of listed species. The FWS initiated formal consultation seeking to ensure that their programs that provide funding for the described activities can be accomplished with some assurance. FWS also expects through this programmatic consultation that an abbreviated individual project consultation/review will ensure timely completion of projects during appropriate work windows and funding cycles. Collectively, this opinion analyzes whether these habitat restoration project activities will jeopardize the continued existence of listed salmonids, or destroy, or adversely modify designated critical habitat. This Opinion also documents consultation under the Magnuson-Stevens Act of 1996.¹ This Opinion was developed pursuant to the Endangered Species Act. It is not intended to, nor does it limit, abridge, abrogate, or otherwise adversely affect any Indian right reserved by treaty, executive order, or statute.

B. Proposed Action

The proposed action includes sixteen categories of habitat restoration activities, described below, to be assessed in this programmatic biological opinion (PBO). Each project category includes a purpose for the action and a description of the action. The proposed action also includes eighteen conservation measures or best management practices (BMP), that shall be included as project conditions for all of the project categories. Additionally, several of the project descriptions include project specific BMPs that are required components of the project and frame the analysis of impacts of the project. These conservation measures, as they apply, will be required elements of each proposed project. The BMPs control the way work is accomplished at the project site and serve to minimize the impacts of the work on listed species and their habitat. Because these conservation measures will be required elements of the project they help inform the overall effects of the projects. “As they apply” recognizes that in addition to the suite of 18 BMPs that apply to all of the project categories there is an additional 19 BMPs that, individually apply to certain of the projects. The 37 BMPs are listed at the end of the project description section below.

¹Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act to establish new requirements for “Essential Fish Habitat” (EFH) descriptions in Federal fishery management plans (FMPs) and to require that Federal agencies consult with NMFS on activities that may adversely affect EFH. Under section 305(b)(4) of the Act, NMFS is required to provide discretionary EFH conservation and enhancement recommendations to Federal and state agencies for actions that may adversely affect EFH. However, state agencies and private parties are not required to consult with NMFS unless that action requires a Federal permit or receive Federal funding.

Construction conducted according to these BMP conditions would cover the sixteen categories of habitat restoration activities within the State of Washington.

Additionally, this consultation includes the development of monitoring and review and reporting standards for these activities. In some cases NMFS will not individually review project documentation pre-construction. In these cases the proposed action defines how projects will be documented and presented to NMFS at periodic reviews. For individual projects with an effects determination of “likely to adversely effect” FWS will provide NMFS staff with project documentation in the form of an “Appendix G.” This informational form simply allows FWS to document a project in an abbreviated biological assessment or individual programmatic biological assessment (IPBA). (See supplemental information in Appendix A)

The sixteen types of restoration projects funded by FWS and consulted on in this Opinion are:

1. Install instream structures

a. **Purpose**

- (1) provide instream spawning, rearing and resting habitat for salmonids
- (2) provide high flow refugia
- (3) increase interstitial spaces for benthic organisms and juvenile salmonids
- (4) increase instream structural complexity and diversity
- (5) promote natural vegetation composition and diversity
- (6) reduce embeddedness in spawning gravels
- (7) reduce siltation in pools
- (8) reduce the width/depth ratio of the stream
- (9) mimic natural input of large woody debris in aquatic systems that have been altered by channelization and land use practices
- (10) restore historic hydrologic regimes
- (11) decrease flow velocities
- (12) deflect flows into adjoining flood plain areas

b. **Description- NOTE: The following activity is done specifically to restore channel- and habitat-forming processes in existing channels. It will not be connected to, or part of, a bank stabilization activity or the creation of a new channel. If the length of the project site is equal to or greater than ½ mile, the project biologist will contact NMFS and USFWS endangered species biologists to jointly determine if the**

project complies and is consistent with the intent² of the programmatic consultation.

Install instream structures capable of enhancing habitat forming processes and migratory corridors within previously degraded stream reaches. These structures include the installation of engineered log jams and other cover structures designed with large woody debris and/or boulder materials. Structures will be installed only in streambed gradients of 6 percent or less. Structure placement activities are limited to areas where structures are, or would be, naturally present. This may include structure types that are designed to lower a stream's width to depth ratio while providing habitat and migratory corridors capable of connecting existing habitats and promoting a naturally functioning channel. Large woody debris structures will be designed to minimize the need for anchoring. However, dependent on site location and design criteria, some structures may be anchored. If anchored, a variety of methods may be used. These include buttressing the wood between riparian trees, cabling the structure to existing structures, and/or anchoring with boulders, concrete blocks or new log wedges. Work may require the use of heavy equipment, power tools, and/or hand crews.

Other project activities may be related to enhancing the development of riparian corridors capable of sustaining water quality and recruitment of woody debris to the system. Restoration activities 8 (Plant native vegetation), 9 (Apply silvicultural treatments), and 10 (Promote native vegetation growth) will be used to describe these project aspects in the riparian corridor.

- c. **Best Management Practices** - All 18 general BMPs will be applied.

2. Improve secondary channel habitats

a. **Purpose**

- (1) increase area available for rearing habitat
- (2) improve access to rearing habitat
- (3) increase hydrologic capacity of side channels
- (4) increase channel diversity and complexity
- (5) provide resting areas for fish and wildlife species at various levels of inundation
- (6) reduce flow velocities

²The action description and the analyses of effects concur that this action does not include instream structure for the purpose of bankline stabilization. It is not the "intent" of the USFWS to include bankline stabilization as a component of this consultation.

(7) provide protective cover for fish and other aquatic species

- b. **Description** - Remove channel and bank sediments to open the channel or increase channel area. Install instream structures capable of enhancing habitat forming processes (see Restoration Activity 1 for a description of instream structure installation). Work may entail use of heavy equipment, power tools, and/or hand crew.
- c. **Best Management Practices** - All 18 general BMPs will be applied.

3. Reduce upland sediment production/delivery

- a. **Purpose**
 - (1) reduce sediment loading of down-slope stream, riparian, and wetland habitats
 - (2) restore vegetation on high gradient slopes
- b. **Description** - This activity is typically undertaken in areas associated with forest roads, cut banks, and steep slopes. These activities are conducted above the ordinary high water mark outside of the riparian area. Structures and/or treatments that may be used include hand terracing, log terracing, live crib wall construction, brush layering, contour wattling, fascine construction and/or grading slopes back to eliminate or reduce erosion. Natural materials such as vegetation, boulders, and woody debris will be installed to reduce erosion and prevent or reduce mass wasting. Additional materials such as rip-rap and fiber matting may be used in conjunction with natural materials to improve stability. Treatment areas will be planted with native trees and shrubs or seeded with native species. Work may entail use of heavy equipment, power tools and/or crew.
- c. **Best Management Practices** - All 18 general BMPs will be applied.

4. Restore wetland hydrology

- a. **Purpose**
 - (1) reestablish hydrologic regime which has been disrupted by human activities, including factors such as water depth, seasonal fluctuations, flooding periodicity, and connectivity
 - (2) improve or reestablish wetland processes and functions which have been disrupted by human activities, such as provision of fish and wildlife habitat, flood water attenuation, nutrient and sediment storage, support of native plant communities and removal of pollutants.

- b. **Description** - Restoration of wetland hydrology may include the excavation and removal of fill materials, development of berms or impoundments with or without the installation of water control structures, reintroduction of beavers in areas where they have been removed, plugging and/or removing drain tiles in agricultural fields, excavating pools and ponds, removal of tide gates, dike breaching, and de-leveling areas that have been leveled. Wetland creation typically involves excavation and/or berm construction to create a geomorphic depression in conjunction with a water source. Hydric soils may be salvaged to provide appropriate substrate and/or seed source for hydrophytic plant community development. Hydric soils will only be obtained from wetland salvage sites. Work may entail use of heavy equipment, power tools and/or crew.
 - c. **Best Management Practices** - All 18 general BMPs will be applied.
- 5. Install/develop wildlife structures
 - a. **Purpose**
 - (1) enhance terrestrial habitats until native plant communities or other natural habitat features become established
 - (2) augment, not replace, natural habitat features and processes
 - b. **Description** - This activity involves the installation or development of a variety of structures that mimic natural features and provide support for wildlife foraging, breeding, and or resting/refuge. These can include bat roosting/breeding structures, avian nest boxes, hardwood snags, brush/cover piles, coarse woody debris, and raptor perches. Work may entail use of power tools and/or crew.
 - c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 19. Prior to implementing this activity when developed specifically for species of concern, FWS Endangered Species Staff (SE) staff will be consulted.
- 6. Reduce livestock impacts
 - a. **Purpose**
 - (1) eliminate or reduce livestock degradation of streams, streambanks, unstable upland slopes and riparian/wetland vegetation
 - (2) reduce soil compaction and erosion
 - (3) reduce fecal input to streams and wetlands
 - (4) improve riparian habitat function

- b. **Description** - Install livestock exclusion fences and cross pasture fences. Installation may involve the removal of native or non-native vegetation along the proposed fence line. Install watering facilities to preclude or limit the need for cattle to access the creek or wetland. Watering facilities will consist of various low volume pumping or gravity feed systems. Either above ground or underground piping will be installed between watering devices and streams or wells. In-water intakes will be screened. Livestock stream crossings may be installed to allow access to pastures. Crossings may consist of a bridge, culvert, or hardened stream section. Hardened stream crossings may involve the placement of angular rock along the stream bottom. Work may entail use of heavy equipment, power tools, and/or hand crews.
- c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 20. Livestock crossings and off-channel livestock watering facilities will be located to minimize compaction and/or damage to sensitive soils, slopes, vegetation, or fish spawning habitat due to congregating livestock. Livestock fords across streams will be appropriately rocked to stabilize soils/slopes and prevent erosion. Stream fords should be placed on bedrock or stable substrates whenever possible. Prior to developing crossings, a survey for redds will be completed to avoid impacts to known spawning reaches.
 - (2) 21. All fish screening projects must be consistent with NMFS' Juvenile Fish Screen Criteria [Appendix-C], and all intake screening projects must be consistent with NMFS' Pump Intake Screen Guidelines [Appendix-D].
 - (3) 37. All new wells or other stock watering sources installed under this activity will be permitted by the Washington State Department of Ecology (WDOE). Project biologists will verify clearance with WDOE contacts.

7. Improve road/trail conditions

- a. **Purpose**
 - (1) eliminate or reduce erosion and mass-wasting hazards and thereby their sedimentation hazards to downslope habitats
 - (2) eliminate or reduce human access and use/disturbance associated impacts, such as: timber theft, disturbance to wildlife, road density, poaching, illegal dumping of waste, erosion of soils, and sedimentation of aquatic habitats, particularly in sensitive areas such as riparian habitats or geologically unstable zones

- b. **Description** - Create barriers to access, such as gates, fences, boulders, logs, tank traps, vegetative buffers, and signs. Relocate portions of road/trail to less sensitive areas. Clear vegetation, pre-existing cut and fill material, replace or place culverts, develop inboard ditch lines and waterbars, create sediment traps, build and compact road prism, spread rock or surfacing material, revegetate bare soils.

Decommission, obliterate, abandon, stormproof, or otherwise make physical changes to existing roads. Install water bars, inslope or outslope road surface, place road surface rock, alter or remove culverts, install cross drains, remove sidecast, reshape road prism, create sediment catch basins, revegetate bare soils, recreate surface drainage patterns, and place dissipaters, chutes or rock at culvert outlets.

Work may entail use of heavy equipment, power tools, and/or hand crew

- c. **Best Management Practices** - All 18 general BMPs will be applied.
- (1) 22. Do not backfill culverts or bridge abutments with vegetation, debris, or mud. Abutments should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards.
 - (2) 23. Develop maintenance schedules for culvert installations to ensure they remain in proper functioning condition.
 - (3) 24. Remove all fill-associated wood during sidecast removal.

8. Plant native vegetation

- a. **Purpose**
- (1) provide feeding, breeding, and sheltering habitat for native wildlife
 - (2) control or eliminate non-native, invasive plant species that compete with or displace native plant communities, in order to maximize habitat processes and functions associated with native vegetation diversity, form, outputs, structure, and decomposition
 - (3) recover watershed processes and functions associated with native plant communities, such as thermal and microclimate regulation, hydrologic and nutrient cycling, channel formation and sediment storage, soil development and stability, flood energy dissipation and filtering
- b. **Description** - Prepare planting sites by cutting, digging, grubbing roots, scalping sod, decompacting soil as needed, and removing existing vegetation. Mow, disc, or level soil at the site. Place woody debris, wood chips, or soil at select locations to alter microsites. Plant specimen or seed in prepared planting site. Fertilize, mulch, wrap stems to protect from rodent girdling, cap buds to protect from herbivores, and transplant from

nearby, established plant sources. Cut or remove competing herbaceous or small woody vegetation during routine maintenance work. Work may entail use of heavy equipment, power tools, and/or hand crew.

- c. **Best Management Practices** - All 18 general BMPs will be applied.

9. Apply silvicultural treatments

- a. **Purpose**

- (1) increase the abundance, growth, size, diversity, and distribution of native trees and shrubs, particularly in riparian areas, to enhance future recruitment of large woody debris to the stream channel to improve instream habitats and channel forming processes
- (2) increase the size and amount of coarse woody debris in riparian areas
- (3) increase the growth, size, and age-class distribution of forest stands to improve stand health, promote biodiversity, and enhance wildlife habitat

- b. **Description** - Thin selected trees by cutting or girdling, in overstocked areas or where conifers will be released or planted in the understory. In most cases, felled whole trees will be left onsite for nutrient cycling, cover, and to reduce elk/deer browse on seedlings. In very few cases, where the economics of thinning for restorative purposes are being evaluated, or USFWS is not funding thinning as part of silvicultural treatments, felled trees may be removed from the site. Manipulate understory vegetation by cutting, chemical application, root digging, or prescribed burning. Leave manipulated vegetation scattered or piled onsite unless fuel loading concerns necessitate removal. Plant select understory tree species. Prune limbs to attain attributes of growth, structure, or form. Work may entail use of heavy equipment, power tools, and/or hand crew.

- c. **Best Management Practices** - All 18 general BMPs will be applied.

- (1) 25. Tree thinning will be designed so that there will not be a reduction of shade along any nearby watercourse.
- (2) 26. Timber yarding systems and techniques will be used that eliminate or reduce soil disturbances and compaction during silvicultural operations.
- (3) 27. Silvicultural activities (e.g., herbicide treatment, thinning, and harvesting) will be limited or restricted on steep slopes and highly erodible soils to prevent accelerated soil erosion and increased sedimentation rates.

- (4) 28. Prescribed burning will be planned and managed to maximize the benefits and reduce the detrimental effects of burns. Fire suppression equipment will be located at the project site during prescribed burnings.
- (5) 29. Chemicals will only be considered when other treatments would be ineffective or cannot be applied. State certified applicators will be used. Manual spraying of chemicals in riparian areas will not be conducted when wind speeds exceed 7 miles per hour or within 48 hours of a forecasted rainfall. In adherence with NMFS guidance, spraying for control of invasive vegetation will not be conducted within 25 feet from the edge of the high water line, which is defined as the highest possible water level expected within a 5-year period. Herbicide use is limited to those chemicals appropriate to treat the target organism and approved by the FWS for application on FWS lands (See Appendix H). All label conditions must be followed.

10. Promote native vegetation growth

a. **Purpose**

- (1) alter existing or competing plant communities to recover or maintain select native plant communities
- (2) control or eliminate non-native, invasive plant species that compete with or displace native plant communities, in order to maximize habitat processes and functions associated with native vegetation diversity, form, outputs, structure, and decomposition
- (3) recover watershed processes and functions associated with native plant communities, such as thermal and microclimate regulation, hydrologic and nutrient cycling, channel formation and sediment storage, soil development and stability, flood energy dissipation and filtering

- b. **Description** - In upland areas: Apply mechanical, physical, chemical, or burn techniques. Cut, brush, hay, dig, mulch, or shade/cover vegetation. Set and control prescribed burning. Apply herbicides. Time and limit grazing. Alter soil composition by the addition of amendments or removal of organics. Work may entail use of heavy equipment, power tools, and/or hand crew.

In riparian/aquatic areas: Apply mechanical, physical, chemical, or burn techniques. Cut, brush, hay, dig, mulch, or shade/cover vegetation. Pull individual plants or clumps of vegetation. Set and control prescribed burning. Apply herbicides. Time and limit grazing. Alter soil

composition by the addition of amendments or removal of organics. Work may entail use of heavy equipment, power tools, and/or hand crew.

- c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 26. Timber yarding systems and techniques will be used that eliminate or reduce soil disturbances and compaction during silvicultural operations.
 - (2) 28. Prescribed burning will be planned and managed to maximize the benefits and reduce the detrimental effects of burns. Fire suppression equipment must always be located at the project site during prescribed burnings.
 - (3) 29. Chemicals will only be considered when other treatments would be ineffective or cannot be applied. State certified applicators will be used. Manual spraying of chemicals in riparian areas will not be conducted when wind speeds exceed 7 miles per hour or within 48 hours of a forecasted rainfall. In adherence with NMFS guidance, spraying for control of invasive vegetation will not be conducted within 25 feet from the edge of the high water line, which is defined as the highest possible water level expected within a 5-year period. Herbicide use is limited to those chemicals appropriate to treat the target organism, and approved by the FWS for application on FWS lands (See Appendix H). All label conditions must be followed.

11. Remove/setback hydraulic constrictions

- a. **Purpose**
 - (1) eliminate or reduce adverse effects of artificial structures which impede or prevent full hydraulic capacity of a watercourse
 - (2) provide for increased hydraulic capacity, dissipation of hydraulic energy, release of stored bedload, reestablishment of pre-disturbance hydrology, and improved riparian and channel complexity
- b. **Description** - Reducing or eliminating hydraulic constrictions involves activities such as levee setback, and dike or impoundment removal. Heavy equipment is typically used to break up, excavate, and remove material that forms the artificial structure. Following removal, the area may be re-contoured to pre-disturbance conditions. Work may entail use of heavy equipment, power tools and/or crew. Explosives may be used in some situations where equipment access, haul routes, or spoil disposal areas are limited; explosives will not be used in water.
- c. **Best Management Practices** - All 18 general BMPs will be applied.

12. Remove structural barriers

a. **Purpose**

- (1) improve fish passage, prevent streambank and roadbed erosion, facilitate natural sediment and wood movement, and eliminate or reduce excess sediment loading
- (2) eliminate or reduce dynamic changes in stream flow patterns through culverts that cause streambank erosion, undermining of roadbeds, and the washout of culverts

b. **Description** - Culverts will be removed, where possible, and natural channel cross section reestablished. Undersized culverts which present a barrier to up and/or downstream fish movement due to excessive velocity or height, will be replaced with appropriately sized culverts. Perched culverts will be lowered and set below the natural bed of the stream (i.e. partially buried). Misaligned culverts will be excavated and realigned. Where replacement or lowering is not feasible, culverts may be modified by installing baffles to redirect or reduce flow velocities, step-and-pool weirs at culvert outlets, trash/debris racks, or erosion protection structures at culvert outlets or inlets. Stream crossings determined to be inappropriate for culvert installations will be redesigned for steel/concrete reinforced bridge installations; bridge footings will not be placed below the line of ordinary high water. Artificial structures that impede fish passage will be removed or lowered. Guidelines provided by WDFW's fish passage at road culverts will be used where feasible. Work may entail use of heavy equipment, power tools, and/or crew. Explosives may be used in some instances to remove diversion structures where equipment access is limited; explosives will not be used in water.

c. **Best Management Practices** - All 18 general BMPs will be applied.

- (1) 22. Do not backfill culverts or bridge abutments with vegetation, debris, or mud. Abutments should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards.
- (2) 23. Develop maintenance schedules for culvert installations to ensure they remain in proper functioning condition.
- (3) 30. Where trash/debris racks are installed to prevent blockage or damage to culverts or fishways, they must be installed and maintained in such a manner that fish are easily able to pass through them at any time.
- (4) 33. At a minimum, projects will be designed to meet WDFW's fish passage criteria for salmon and trout.

13. Collect information/monitor

- a. **Purpose**
 - (1) collect information about existing on-ground conditions relative to habitat type, condition, and impairment; species presence, abundance, and habitat use; and conservation, protection, and restoration opportunities or effects
- b. **Description** - Measure/assess and record physical measurements by visual estimates or with survey instruments. Manually install rebar or other markers along transects or reference points. Manually install piezometers and staff gauges to assess hydrology. Locate and measure physical features associated with structures on watercourses (such as culverts, bridges, gauges, and dams). Visually locate and record fish presence, redds, or carcasses. Visually locate, identify, and record plant presence, frequency, and condition. Inventory roads for general condition, needed work, and sediment sources. Work may entail use of trucks, survey equipment, hand tools, and crews.
- c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 31. Monitoring and information collection techniques will not entail use of an electroshocker.
 - (2) 32. Stream surveyors will stay out of the channel as much as possible. If and when surveyors enter the channel, they will avoid disturbing spawning areas.

14. Install/modify fish passage structures

- a. **Purpose**
 - (1) Provide fish passage beyond artificial barriers (such as dams and spillways) when removal of those artificial barriers is not feasible
- b. **Description** - **NOTE: the intent of this activity is to address small stream blockages that occur at small diversion dams, stock watering reservoirs, and otherwise legally maintained structures on smaller stream systems. This project description is not intended to include large scale, mainstem, hydroelectric or flood control dams or other large scale projects, or to provide passage beyond natural barriers. If there is any question as to the applicability of this description to a project site, the project biologist will consult with NMFS and USFWS endangered species biologists to jointly determine if the project complies and is consistent with the intent of this programmatic consultation.**
Construct a flume or similar device, with baffles or a series of stepped pools, to slow water velocities and provide adequate water depths which

enable fish passage. Depending on site conditions, work may deepen plunge pools, install debris deflectors, maintain attracting entrance flows, and divert fish into appropriate passage structures. Work may entail use of heavy equipment, power tools, and/or hand crew.

- c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 33. Projects will be designed to meet WDFW's fish passage criteria for salmon and trout at a minimum.
 - (2) 30. Where trash/debris racks are installed to prevent blockage or damage to culverts or fishways, they must be installed and maintained in such a manner that fish are easily able to pass through them at any time.

15. Install signs

- a. **Purpose**
 - (1) display project-related information
 - (2) encourage fish, wildlife, and habitat protection
 - (3) notify/educate/warn the public
- b. **Description** - Signs of varying sizes will be nailed either to trees or posts or fences, or erected on concrete-reinforced posts or metal supports. Hole digging and brushing of vegetation may be associated. Work may entail use of power tools and/or hand crew.
- c. **Best Management Practices** - All 18 general BMPs will be applied.

16. Deploy salmon carcasses

- a. **Purpose**
 - (1) increase biomass to food webs and nutrient cycling processes
 - (2) supply immediate nutrient enrichment to stream and riparian habitats
 - (3) enhance feeding opportunities for wildlife, juvenile salmon, and aquatic invertebrates
 - (4) enhance riparian vegetation nutrient uptake by adding organic matter
- b. **Description** - Obtain salmon carcasses from non-stream sources, generally hatcheries, to distribute in stream systems that have below-historic numbers of salmon carcasses. Truck carcasses to distribution points and carry smaller batches out for deployment. Deploy randomly throughout riparian and stream areas by placing individual or

several carcasses on the ground, in the water, or wedging into accumulated wood. Work may entail use of trucks and hand crew.

- c. **Best Management Practices** - All 18 general BMPs will be applied.
 - (1) 34. WDFW's *Protocols and Guidelines for Distributing Salmonid Carcasses to Enhance Stream Productivity in Washington State* (see Appendix E) will be followed.
 - (2) 35. Salmon carcass deployment will not be conducted in areas where documented grizzly bear sightings have occurred within the last 4 weeks.
 - (3) 36. Carcass deployers will avoid entering stream channels.

How these restoration activities will be accomplished are defined by the conservation measures or BMPs. The BMPs control the way work is accomplished at the project site and serve to minimize the impacts of the work on listed species and their habitat. If a FWS project biologist agrees to waive a BMP a tiered consultation process requires that NMFS concurs with the decision to waive the BMP. Otherwise, the project will require an individual consultation. NMFS may also withhold concurrence and require the project undergo individual section 7 consultation when it believes that the scope or intent of a project does not fit within one of the above sixteen project descriptions.

Conservation Measures: The 18 standard conservation measures/BMPs applied to all projects that are designed to reduce impacts on ecosystems, listed species and their habitats are as follows:

1. All regulatory permits and official project authorizations (e.g., National Environmental Policy, National Historic Preservation Act, Level I Contaminants Survey, WDFW's Hydraulic Project Approvals and permits from the Army Corps of Engineers, etc.) must be secured before project implementation. All terms and conditions in these regulatory permits and other official project authorizations must be followed to eliminate or reduce adverse impacts to any endangered, threatened, or sensitive species or their critical habitats.
2. Modifications to an approved work plan must be reviewed and approved by the project biologist and the cooperators and/or landowner(s) before the work can be carried out or continued. This would include changes requiring modifications of permits, or alterations to the scope, design, or intent of the project.
3. Use existing roadways or travel paths for access to project sites, where feasible.
4. Avoid the use of heavy equipment and techniques that will result in excessive soil disturbances or compaction of soils, especially on steep or unstable slopes.
5. Use of heavy equipment in or adjacent to streambeds and streambanks, and ingress/egress points must be minimized to reduce sedimentation rates, channel

instability, and aquatic habitat impacts. Vehicles and machinery must cross streams at right angles to the main channel whenever possible. Ingress/egress points will be minimized. Heavy equipment will be cleaned (e.g., power washed, steamed, etc.) prior to use below the ordinary high water mark. Machinery will be inspected for leaks of hydraulic fluid or fuel after cleaning and prior to entering sensitive areas.

6. Excavation or transport equipment/machinery will be limited in capacity, but sufficiently sized to complete required restoration activities.
7. Streams, riparian zones, and wetlands must not be used as equipment staging or refueling areas. Equipment must be stored, serviced, and fueled away from aquatic habitats or other sensitive areas.
8. In the riparian area, entry and disturbance by equipment will be minimized. Undisturbed vegetated buffer zones must be retained along stream channels to reduce sedimentation rates, channel instability, and aquatic habitat improvements. Cable systems will be used, where appropriate, to eliminate or reduce the need for ground-based equipment.
9. Native vegetation must be planted on disturbed sites (including project site, disposal and staging areas, and access roads), when necessary to reduce soil erosion, establish cover, provide shade, and prevent non-native plant colonization. The use of nonnative vegetation will be strictly limited and will apply to situations where native vegetation (i.e., grasses) is not commercially available. All nonnative vegetation must be a close subspecies or variety to native species or reproductively altered (i.e., sterilized) to avoid future ecological complications with native species. Vegetative planting techniques must not cause major disturbances to soils and slopes.
10. Boulder, rock, and large woody debris materials used for restoration projects must not be removed from any streams.
11. Sedimentation and erosion controls (i.e., hay bales, silt fence, de-watering, etc.) must be implemented on all project sites where restoration activities are implemented, materials or equipment is staged or stockpiled, or fill is placed, to minimize the release of fines into the aquatic environment (See Appendix J [of the PBA] for proper installation techniques for hay bales, silt fences etc.).
12. Excavated materials removed during the completion of a restoration activity must be salvaged and/or disposed of properly and/or stabilized to eliminate future environmental problems.

13. All garbage from work crews must be removed from the project site daily and disposed of properly. All waste from project activities must be removed from the project site before project completion and disposed of properly.
14. Structures containing concrete or wood preservatives must be cured or dried before they are placed in streams, riparian zones, or wetlands. Creosote treated wood will not be used. Wet concrete or runoff from cleaning tools that have wet concrete slurry or lye dust must never enter aquatic habitats. Runoff control measures must be employed, such as hay bales and silt fences, until the risk of aquatic contamination has ended.
15. Inspection will be performed within 1 year following project completion to ensure that restoration activities implemented at individual project sites do not create unintended consequences to fish, wildlife, and plant species, and their critical habitats. Corrective actions, as appropriate, must be taken for potential or actual problems.
16. Soil and/or slope disturbances along stream channels should be eliminated or reduced wherever possible. Undisturbed vegetated buffer zones will be retained along stream channels to the greatest extent possible to reduce sedimentation rates, channel instability, and aquatic habitat impacts.
17. Till unvegetated compacted road surfaces to promote vegetation establishment and growth. Drainage improvements should be constructed and stabilized before the rainy season. Do not sidecast excavated road materials, and avoid accumulating or spreading these materials in upland draws, depressions, intermittent streams, and springs. Efforts will be made to restore the original hydrology of the site.
18. Fill material used on project sites must be from non-streambed and non-wetland sources that are free of fines.

These additional BMPs are project specific and their applicability are noted in the BMP sections of the individual projects descriptions above. They are:

19. Prior to implementing this activity when developed specifically for species of concern, SE staff will be consulted.
20. Livestock crossings and off-channel livestock watering facilities will be located to minimize compaction and/or damage to sensitive soils, slopes, vegetation, or fish spawning habitat due to congregating livestock. Livestock fords across streams will be appropriately rocked to stabilize soils/slopes and prevent erosion. Fords should be placed on bedrock or stable substrates whenever possible. Prior to

developing crossings, a survey for redds will be completed to avoid impacts to known spawning reaches.

21. All fish screening projects must be consistent with National Marine Fisheries Service's Juvenile Fish Screen Criteria (enclosed), and all intake screening projects must be consistent with NMFS' *Pump Intake Screen Guidelines* (enclosed).
22. Do not backfill culverts or bridge abutments with vegetation, debris, or mud. Abutments should be properly protected (e.g., rock armored) to prevent future scouring actions and erosion hazards.
23. Develop maintenance schedules for culvert installations to ensure they remain in proper functioning condition.
24. Remove all fill-associated wood during sidecast removal.
25. Tree thinning will be designed so that there will not be a reduction of shade along any nearby watercourse.
26. Timber yarding systems and techniques will be used that eliminate or reduce soil disturbances and compaction during silvicultural operations.
27. Silvicultural activities (e.g., herbicide treatment, thinning, and harvesting) will be limited or restricted on steep slopes and highly erodible soils to prevent accelerated soil erosion and increased sedimentation rates.
28. Prescribed burning will be planned and managed to maximize the benefits and reduce the detrimental effects of burns. Fire suppression equipment will be located at the project site during prescribed burnings.
29. Chemicals will only be considered when other treatments would be ineffective or cannot be applied. State certified applicators will be used. Manual spraying of chemicals in riparian areas will not be conducted when wind speeds exceed 7 miles per hour or within 48 hours of a forecasted rainfall. In adherence with NMFS guidance, spraying for control of invasive vegetation will not be conducted within 25 feet from the edge of the high water line, which is defined as the highest possible water level expected within a 5-year period. Herbicide use is limited to those chemicals appropriate to treat the target organism and approved by the USFWS for application on USFWS lands. All label conditions must be followed.

30. Where trash/debris racks are installed to prevent blockage or damage to culverts or fishways, they must be installed and maintained in such a manner that fish are easily able to pass through them at any time.
31. Monitoring and information collection techniques will not entail use of an electroshocker.
32. Stream surveyors will stay out of the channel as much as possible. If and when surveyors enter the channel, they will avoid disturbing spawning areas.
33. Projects will be designed to meet Washington State's fish passage criteria for salmon and trout at a minimum.
34. WDFW's *Protocols and Guidelines for Distributing Salmonid Carcasses to Enhance Stream Productivity in Washington State* will be followed.
35. Salmon carcass deployment will not be conducted in areas where documented grizzly bear sightings have occurred within the last 4 weeks.
36. Carcass deployers will avoid entering stream channels.
37. All new wells or other watering sources installed under the reduce livestock impacts activity will be permitted by the Washington Department of Ecology (WDOE). Project biologists will verify and document clearance with WDOE contacts.

The general project description along with the eighteen standard conservation measures and the project specific conservation measures define and minimize the short-term adverse impacts that can be expected to occur from the projects.

II. STATUS OF THE SPECIES AND CRITICAL HABITAT

The action area is defined by NMFS regulations (50 CFR 402) as "all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action." The action area for the programmatic BA and this Opinion is the State of Washington, specifically any streams that contain listed anadromous salmonids under NMFS trust responsibility. Essential habitat features for salmonids are: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions. The proposed activities described in the programmatic BA may affect all of these essential habitat features.

References for further background on listing status, biological information and critical habitat elements can be found in Table 1.

Table 1. References for additional background on listing status, critical habitat, protective regulations, and biological information for the listed species addressed in this Biological Review.

Species	Listing Status	Critical habitat	Protective Regulations	Biological Information, Population Trends
Snake River sockeye salmon	November 20, 1991, 56 FR 58619 Endangered	December 28, 1993, 58 FR 68543	ESA prohibition on take applies	Waples <i>et al.</i> 1991a; Burgner 1991; ODFW and WDFW 1998
Ozette Lake Sockeye	March 25, 1999, 64 FR 14508, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Gustafson <i>et al.</i> 1997; WDFW 1993
Hood Canal Summer-run Chum Salmon	March 25, 1999, 64 FR 14508, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Johnson <i>et al.</i> 1997; WDFW 1993
Upper Columbia River steelhead	August 18, 1997, 62 FR 43937 Endangered	February 16, 2000 65 FR 7764	ESA prohibition on take applies	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998; WDFW 1993
Snake River Basin steelhead	August 18, 1997, 62 FR 43937 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Lower Columbia River/Southwest Washington coho salmon	July 25, 1995, 60 FR 38011 Candidate	Not Applicable	Not Applicable	Weitkamp <i>et al.</i> 1995
Lower Columbia River steelhead	March 19, 1998, 63 FR 13347 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Middle Columbia River steelhead	March 25, 1999, 64 FR 14517 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998; WDFW 1993
Columbia River chum salmon	March 25, 1999, 64 FR 14508 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Johnson <i>et al.</i> 1997; Salo 1991; ODFW and WDFW 1998; WDFW 1993
Snake River Fall chinook salmon	April 22, 1992, 57 FR 14653 Threatened	December 28, 1993, 58 FR 68543	July 22, 1992 57 FR 14653	Waples <i>et al.</i> 1991b; Healey 1991; ODFW and WDFW 1998
Lower Columbia River chinook salmon	March 24, 1999, 64 FR 14308 Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Myers <i>et al.</i> 1998; Healey 1991; ODFW and WDFW 1998; WDFW 1993
Snake River spring/summer chinook salmon	April 22, 1992, 57 FR 14653 Threatened	December 28, 1993, 58 FR 68543 and October 25, 1999, 64 FR 57399	April 22, 1992 57 FR 14653	Matthews and Waples 1991; Healey 1991; ODFW and WDFW 1998
Puget Sound chinook salmon	March 24, 1999, 64 FR 14308, Threatened	February 16, 2000 65 FR 7764	July 10, 2000 65 FR 42423	Myers <i>et al.</i> 1998; WDFW 1993
Upper Columbia River spring run chinook salmon	March 24, 1999, 64 FR 14308 Endangered	February 16, 2000 65 FR 7764	ESA prohibition on take applies	Myers <i>et al.</i> 1998; Healey 1991; ODFW and WDFW 1998; WDFW 1993

III. EVALUATING PROPOSED ACTIONS

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 CFR 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements of the listed species; and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed species' life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

NMFS also evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential feature of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat, it must identify any reasonable and prudent alternatives available.

NMFS has developed an analytic methodology for evaluating these effects (Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale, NMFS, 1996.) It is often referred to as the Matrix of Pathways and Indicators, or MPI. In the MPI framework, the pathways for determining the effect of an action are represented as six conceptual groupings (e.g., water quality, channel condition) of a suite of habitat condition indicators. The indicators constitute the habitat aspects of a species' biological requirements--the essential physical features that support spawning, incubation, rearing, feeding, sheltering, migration, and other behaviors. Such features include adequate instream flow, pure cold water, loose gravel for spawning, unimpeded fish passage, deep pools, and abundant large tree trunks and root wads. Indicator criteria (mostly numeric, though some are narrative) are provided for three levels of environmental baseline condition: Properly functioning, at risk, and not properly functioning. The effect of the action upon each indicator is classified by whether it will restore, maintain, or degrade the indicator.

Although the indicators used to assess functioning condition may entail instantaneous measurements, they are chosen, using the best available science, to detect the health of underlying processes, not static characteristics. "Best available science" advances through time. This advance allows PFC indicators to be refined, new threats to be assessed, and species' status

and trends to be better understood. River habitats are inherently dynamic, and the PFC concept recognizes that natural patterns of habitat disturbance will continue to occur. Floods, landslides, windstorms, and fires all result in spatial and temporal variability in habitat characteristics, as do human activities. Unique physiographic and geologic features may cause PFC indicators to vary between different landscapes. For example, aquatic habitats on timberlands in glacial mountain valleys are controlled by natural processes operating at different scales and rates than are habitats on low-elevation coastal rivers. The MPI provides a consistent, but geographically adaptable, framework for making effect determinations. The pathways and indicators, as well as the ranges of their associated criteria, may be altered through the watershed analysis process.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of the listed species under the existing environmental baseline.

A. Biological Requirements

The first step in the method NMFS uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NMFS also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for salmonids to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation a broad array of habitat improvement projects are expected to enable improved habitat utilization. Improved, accessible habitat would make habitat available that functions to support successful spawning, incubation and migration, rearing habitat and over-wintering refugia. Salmon survival in the wild depends upon the proper functioning of certain ecosystem processes, including habitat formation and maintenance. Restoring functional habitats and habitat access depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse impacts of current practices. In conducting analyses of habitat-altering actions, NMFS usually defines the biological requirements in terms of a concept called Properly Functioning Condition (PFC) and utilizes a "habitat approach" to its analysis. The current status of listed salmonids in the State of Washington, based upon their risk of extinction, has not significantly improved since the species were listed. The NMFS is not aware of any new data that would indicate otherwise.

B. Environmental Baseline

ESA regulations (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the 4(d) submittal and review process. The action area is defined to mean “all areas to be affected directly or indirectly by the ... action and not merely the immediate area involved in the action.”

USFWS Restoration Activities

During Fiscal Years 1996, 1997, and 1998, the programs covered by this PBA implemented 93, 90, and 99 restoration projects, respectively, in a total of 65 of the 249 Water Resource Inventory Area (WRIA) sub-basins in Washington. The sub-basins contain approximately 31 percent of the acreage and 26 percent of the stream miles in Washington. Restoration activities funded and initiated by the FWS since 1996 have included a broad array of projects occurring in watersheds with listed salmonids. In excess of 87 miles of stream have been made accessible to salmonids due to fish passage restoration projects. Livestock impacts to streams have been reduced through the completion of 20 livestock crossing projects and the installation of 33 livestock watering projects. Sediment delivery reduction projects have been established on over 50 miles of roadway. Sediment delivery, wildlife enhancement, vegetation enhancement, and signage projects have improved baseline conditions on nearly 1300 acres of wetland projects and over 1000 acres of upland projects. Both wetland and stream riparian projects have accounted for improvements to nearly 700 acres of riparian habitat. While the trend is to focus into fewer WRIs the level of project activity is expected to stay relatively constant for the FWS habitat restoration programs.

For the purpose of this consultation, the action area includes all waters throughout the State of Washington within the range of listed salmon and steelhead. The action area may extend upstream or downstream of permitted projects, based on their potential to affect fish passage, riparian succession, the hydrologic cycle, the erosion, transportation, and deposition of sediments, and other ecological processes related to the formation and maintenance of salmon habitats. Indirect effects may occur throughout the watershed where other activities depend on Regional Program activities for their justification or usefulness.

The scale of the action area covered in this programmatic consultation is so large that describing the environmental baseline is a matter of generally describing the existing condition of habitat elements, statewide. To enable such a general description of habitat conditions the NMFS summarizes status information reported in *Changing Our Water Ways: Trends in Washington's Water Systems*, published by the Washington State Department of Natural Resources (DNR) in December 2000. That document reviews the trends affecting aquatic resources statewide.

Decline in the status of salmon and steelhead in Washington State is attributed to myriad factors, including habitat functional quality and amount. Both natural and human-induced activity have contributed to this decline; under formal consultation we focus primarily on human activities.

Natural disturbances are usually relatively short in duration and occur infrequently. While human disturbances may have minimal impacts individually, the number, magnitude, duration, and cumulative impacts since Euro-American settlement combine to form the primary cause of the decline of numerous salmon stocks. Historical and current human-caused disturbances include: Clearing and channelizing rivers, sending logs down streams via splash dams, extensive land clearing, diverting water, livestock grazing in waterways, mining run-off, constructing logging roads and accelerating erosion, removing old growth forests, filling and diking of wetlands and estuaries, armoring shorelines and streambanks, developing hydroelectric dams, creating barriers to fish migration, increasing surface run-off, contaminating water and sediments, introducing non-native plants and animals, changing levels of oxygen and nutrients in waterways and over fishing.

Human activity and development can have significant and damaging impacts on the environment, and today's growing population means that there will be increasing pressure on the state's natural resources. Washington's population – 5.8 million in 2000– is expected to increase by nearly 2 million by the year 2020. In 1999, 46,000 more people were added to the state. Adding this many people leads to concerns about how to provide clean and adequate water for fish and wildlife. While each watershed is unique, the issues can be grouped into broad categories:

- Interrupting the flow of water
- Alterations to aquatic ecosystems
- Shoreline modifications
- Effects of shipping and transportation
- Pollution

Interrupted flow regime

Today, there are 1,025 dams obstructing the flow of water in Washington; this number includes any structure that can store 10 or more acre-feet of water. Because dams obstruct the flow of rivers, they change the physical flow of water, resulting in areas that are either drier than normal or flooded. Changing the depth and flow of rivers also affects the water's temperature.

Dams also change the flow of materials carried in river water. They stop the flow of debris, nutrients, and sediments. As a result, reservoirs eventually fill with sediments and inadequate amounts of sediments reach the deltas and estuaries. Dams also change the movement of fish migrating between the streams and oceans. In addition to the many dams blocking fish movement, an estimated 2,400 human-made barriers, including dikes, culverts and tide gates block passage to an estimated 3,000 miles of freshwater spawning and rearing habitat.

In a more recent report, the WDFW indicates there is a minimum of 2,400-4,000 human-made barriers blocking 3,000-4,500 miles of freshwater spawning and rearing habitat for salmon.³ A recent critique of the Washington State Hydraulic Code estimated that there are approximately 8,800 culvert related barriers blocking over 6,000 miles of habitat. The authors estimated an annual lost opportunity of 10 million adult salmon. (Hollowed and Wasserman, 2000)

In many river basins, irrigation projects have significantly changed the timing, quantity and quality of flow in the rivers and tributaries. Flood control dikes and highway construction have cut off the rivers from their historic flood plains and wetlands, resulting in habitat destruction, changes in stream temperature and nutrient composition alterations. In the Yakima River Basin, these changes have contributed to the reduction of historically abundant runs of salmon and steelhead. Today, summer chinook, native coho and anadromous sockeye are extinct and spring chinook declined from 9,300 in 1986 to 645 in 1997.

Sometimes human impacts and natural events combine to change the flow of a river. The natural course of a river includes its flood plain. In what is known as avulsion, a surface mine pit located in a flood plain may suddenly reroute a river during a flood, “capturing” the river. Gravel spawning beds or other habitat in an abandoned channel become unavailable to fish. Gravel from upstream gradually fills the breached mine pit instead of getting washed downstream to replenish gravel bars. The river becomes less stable and less hospitable to salmon. When the east fork of the Lewis River was captured in 1995, it abandoned 1,700 feet of gravel spawning beds, and when captured again in 1996 it abandoned another 3,200 feet.

The availability of water has long been a major issue for all Washington residents, including its aquatic species. Today, decisions about apportioning the flow--who gets water and how much they get--is a hot topic debated by local, state, and federal governments, businesses and private landowners. Of Washington’s 62 WRIAs, 16 have both an ESA-listed salmon stock and a water-supply problem. There is not enough water to supply the water rights granted to people in those 16 basins and to also support fish and water quality in those streams. In addition, about 450 lakes and streams in Washington are partially or completely closed to further withdrawals.

With 5.8 million people living in Washington, much of the land surface has been covered by impervious surfaces. All this development affects the amount of water that seeps into the ground and washes into streams; it also affects how quickly the water gets there. When land is covered with pavement or buildings, the area available for rainwater and snowmelt to seep into the ground and replenish the groundwater is drastically reduced; in many urban areas it is virtually eliminated. The natural movement of water through the ground to usual discharge points such as springs and streams is altered. Instead, the natural flow is replaced by storm sewers or by more concentrated entrance points of water into the ground.

Changing the timing and amount of water run-off can lead to too much water going directly into streams in the rainy months of winter instead of soaking into the ground. Consequently, there

³SSHB 2879 Fish Passage Barrier Removal Grant Program Report, WSDOT and WDFW, January 1999.

isn't enough water in the ground to slowly release into streams in the dry months of summer. Too much water in the winter can cause fish habitat to be scoured by unnaturally swift currents; not enough water in streams in the summer leads to water temperatures too high to support fish.

Studies show that when impervious surfaces such as pavement and buildings cover between 5 percent to 8 percent of an urban watershed, the health of streams and the fish in them declines, despite stormwater controls. In the south Puget Sound area, most urban watersheds are 20 percent to 40 percent covered with hard surfaces, altering stream flows, water temperatures, and in-stream habitat for everything from insects to fish.

Altered Aquatic Ecosystems

From high mountain streams to coastal shorelines, Washington's varied landscapes provide diverse aquatic habitats. Since the arrival of settlers in the early 1800s, at least 50 percent and as much as 90 percent of riparian habitat in Washington has been lost or extensively modified.

Wetlands improve water quality by filtering out sediments, nutrients, and toxic chemicals. However, research shows that a watershed can withstand having only 5 percent to 8 percent of its land base covered with buildings, roads, and other impervious surfaces before significant changes in wetland functions and stream hydrology begin to occur. Because the value of wetlands and their overall environmental importance have been recognized only recently, Washington has almost two centuries of wetland conversion. A 1989 report by the U.S. Fish and Wildlife Service estimated that activities such as draining and filling reduced Washington's wetland areas by 33 percent since statehood, from 1.4 million acres to 938,000 acres.

Estuary losses have occurred primarily through conversions to farms and cities. In the Skagit Valley, for example, a large majority of the estuary mud flats and flood plain was converted to farmland before the first land surveys of 1889. Nearly 75 percent of the wetland area was lost before statehood. Currently less than 3 square miles of tidal estuary wetland remain, a 93 percent loss.

When tidal flood plains, estuaries and tide floats are destroyed or significantly disturbed, critical functions are at risk. The vast food source is diminished and silt that is carried along by currents to replenish beaches and nearshore habitat is lost. Replacing estuaries with farms, industry, and cities destroys habitat critically needed by salmon.

Eelgrass, a marine flowering plant, grows low in the intertidal zone and in mud and sand in the shallow subtidal zone. It is critical to salmon recovery efforts because it provides fish a place to hide and evade predators. It also provides food and habitat for salmon prey. Because of where it grows, eelgrass is largely inaccessible and hard to survey. As a result, it's unclear how much eelgrass has disappeared from Puget Sound waters over the past 100 years. However, the historical data that scientists do have suggest that eelgrass beds in Bellingham Bay have declined by about 50 percent over the past 100 years; a figure fairly consistent throughout its range in Washington.

The amount of dissolved oxygen in water is an important measurement of overall water quality. Areas of Puget Sound are experiencing lower levels of dissolved oxygen. In March 2000, the Puget Sound Water Quality Action Team identified 87 areas in Puget Sound that had problems with low dissolved oxygen. Human actions are the main contributor to depleted oxygen. Excessive fertilizers and nitrogen applied to yards and fields, and fecal matter from septic fields and failing septic systems, contribute pathogens and nutrients that can deplete oxygen. Because there is little historical data on dissolved oxygen concentrations in marine waters, it is difficult to compare the health of Washington's marine waters of today to those of the past. However, based on measurements of dissolved oxygen in the southern part of Hood Canal made in the 1950s and 1960s, today's dissolved oxygen concentrations are lower, more frequently.

The introduction of non-native (exotic) species has been known to profoundly affect ecosystems by disrupting food webs and displacing native species. Because of a lack of natural predators or competitors, these introduced species can spread rapidly. In 1998, an expedition looked in Puget Sound for non-native species, and discovered more than 52 invasive species. Non-native species are introduced primarily through shipping, aquaculture, research, and aquaria industries. The following are examples of some of the most tenacious and insidious non-native species that have invaded Washington's waters and aquatic ecosystems:

- Eurasian Water Milfoil, an aquatic plant found in lakes and slow-moving streams. It can lower dissolved oxygen and increase pH; displace native aquatic plants and increase water temperature.
- Parrotfeather is limited to coastal lakes and streams, the Columbia River, the Chehalis River and private ponds and lakes. The emergent stems shade the water column, eliminating algal growth, which is the basis of the aquatic food web.
- Purple Loosestrife generally grows in marshes, ponds, streambanks, ditches and lake shores. Because it grows so aggressively, large stands take over an area and eventually replace the native plant species, eliminating the natural food and cover essential to native shoreline and wetland inhabitants.
- Hydrilla roots in lake sediments and grows rapidly under very low light conditions. Hydrilla can fill the water column with vegetation, displacing native fish and wildlife.
- Spartina is an exotic species of intertidal cordgrass. If left uncontrolled, Spartina transforms mud flats into dense, raised meadows, cut by narrow, deep channels. The loss of mud flats, eelgrass, and algae directly affect native fish species that depend on these areas for feeding, spawning and rearing.

Shoreline Modification

Washington has more than 3,000 miles of marine shoreline. When these shorelines are changed or eradicated, intertidal and nearshore habitat is affected or lost, causing significant stress on the

salmon that rely on these habitats. Modifications of shorelines include bulkheads, docks, piers, or areas that have been filled or dredged.

Few statistics exist on the extent of freshwater shoreline modification. One lake that has received some attention is Lake Washington, in Seattle. More than 80 percent of its shoreline has been armored against erosion and over 3000 residential piers cover approximately 2.5 percent of the lake's surface. Adverse effects of these shoreline modifications include loss of riparian vegetation, shading of the nearshore aquatic zone, and an increase in attractive refugia for piscivorous birds and fish.

Development of Washington's marine and estuarine shoreline over the past 100 years has created a landscape that is dramatically different from what the first settlers found. About 800 miles of the Puget Sound shoreline have been modified, with 25 percent of the modifications in the intertidal areas. Up to 52 percent of the central Puget Sound shoreline and about 35 percent of the shorelines of Whidbey Island, Hood Canal, and south Puget Sound have been changed or eradicated. To help protect their shoreline property from erosion, many waterfront homeowners construct bulkheads between their land and the beach. Ironically, one consequence of bulkheads is the loss of sand from the beach and beach erosion. The natural process of bluff erosion provides a supply of sand and rocks to the beach. Construction of bulkheads cuts off this supply of beach-building material and prevents the wave's energy from dissipating. A 1998 survey in Puget Sound found that nearly 15 percent of armored beaches had mostly large rocks and minimal sediment compared to only one percent of unarmored beaches. The loss of sand and pebbles affects small fish that use this habitat for spawning. These small fish form the base of the food chain for larger fish.

The Shoreline Management Act was passed in 1971 to protect the state's shorelines from development impacts. However, since passage of the Act, about 26,000 permits have been issued statewide for substantial shoreline development projects. This number does not include single family homes, which are exempt from the permit process.

Shipping and Transportation

Since the days of early settlement, marine shipping has played a key role in the state's economy, and ports are the critical hub of this waterborne trade. Early dredging, filling, and other alterations of shallow estuarine areas were devastating to the fish that depended on the habitat as a transition from freshwater to saltwater. Over time, the increased demand for shipping facilities led to more dredging and filling until today an average of 50 percent of the original wetland habitat in Puget Sound's major bays has been destroyed. Bays near urban centers such as Tacoma and Seattle have less than 5 percent of their natural intertidal habitat left.

There are 48 ports in Washington's waters. The total tonnage shipped from those ports has increased 60 percent over the past five decades, and shipping container traffic is expected to double in the next 20 years. Not only are there more ships, but the ships are being built bigger. To accommodate larger ships, ports expand and shipping channels are dredged deeper. Dredging

the bottom of bays and rivers displaces plants and animals living there and can stir up contaminated sediments. Dumping dredged materials elsewhere in the water smothers habitat.

In the late 1990s, the Army Corps of Engineers proposed deepening the Columbia River's existing navigation channel to accommodate larger ships. Over the 50-year life of the project, the deeper channel will result in 267 million cubic yards of material which would need to be disposed in the river, in the ocean, or on land. The disposal of dredged material will result in the loss of at least 67 acres of habitat in the river, 200 acres of agricultural land, and 20 acres of wetlands. The dredging project will alter the critical habitat of at least 13 species of listed salmon, damage prey species stocks, and alter the food web.

Ports expand to accommodate not only more ships, but larger ships as well. The shipping industry continually builds larger ships to carry larger cargo loads. In response, ports enlarge their facilities and deepen their navigation channels so that larger vessels can dock and unload their goods. The larger vessels carry more ballast water, which when dumped into Washington's waters has the potential of introducing exotic species. Increased shipping activity affects more than just the waterfront—it also results in an increased need for overland transportation. More trucks and rail cars are needed to transfer goods to and from ships and inland destinations. Aquatic ecosystems are at risk of becoming polluted by more petroleum-carrying run-off from increased traffic on roads.

Pollutants

Washington is rich in water resources, but there are unseen risks in many of the state's water bodies. Of the 1,099 lakes, streams, and estuaries for which there is data, 643 (59 percent) are so impaired they don't adequately provide for swimming, fishing or habitat. The main causes of water quality problems are related to human activities, such as farming, failing septic systems, increased erosion along streams, and pollutants added to land and water.

The mud and sand in many places beneath Washington's waters are so contaminated they don't meet state and federal standards. More than 3,000 acres of Puget Sound sediments are so contaminated that federal laws require they be cleaned up. Of the state's 112 contaminated sites identified by the Washington State Department of Ecology, 93 are in saltwater and 19 are in freshwater. Contaminated sediments are detrimental to the health and diversity of aquatic populations.

Declines in Fish

Salmon provide critical links in an entire food web. They transport energy and nutrients between the ocean, estuaries, and freshwater environments, even in death. Recent calculations indicate that only three percent of the marine nutrients once delivered by anadromous salmon to the rivers of Puget Sound, the Washington Coast, and the Columbia River are currently reaching those streams. Researchers surmise this is due to the substantial decline in salmon populations over the past several decades.

The decline in salmon over the past several decades is the result of both natural and human factors. Forestry, agriculture, mining, and urbanization have degraded, simplified, and fragmented habitat. Water diversions for agriculture, flood control, domestic, and hydro power purposes have greatly reduce or eliminated historically accessible habitat. Studies indicate that in most western states, about 80% to 90% of the historic riparian habitat has been eliminated. (NMFS, 1998)

Conclusion

In its conclusions, *Changing our Water Ways* makes it clear that our efforts to resolve resource problems in the past have led to the cumulative effects of dams, agricultural practices, urban development, and industrial activity. Existing policies and programs may not be sufficient to address current environmental challenges. Washington's aquatic habitat has disappeared or is so impaired it no longer supports life the way it used to; populations of many aquatic animals, including listed salmon, are in serious decline. Water quality is poor and riparian structure and function has been significantly altered from historical conditions.

NMFS concludes that not all of the biological requirements of the species within the action area are being met under current conditions, based on the best available information on the status of the affected species; information regarding population status, trends, and genetics; and the environmental baseline within the action area. Significant improvement in habitat conditions over those currently available under the environmental baseline is needed to meet the biological requirements for survival and recovery of these species. Any further degradation of these conditions would have a significant impact due to the amount of risk they presently face under the environmental baseline.

IV. ANALYSIS OF EFFECTS

A. Effects of the Proposed Actions

The FWS as a funding source and project collaborator makes certain assumptions about the projects that will be facilitated by this programmatic consultation. First, it is assumed that the identified restoration activity has been determined to be an appropriate management action to take at a particular location, given watershed and site conditions. It is a project application criteria in the form of goals and requirements that projects address watershed assessment identified issues. Second, it is assumed that the restoration activity will be implemented using current methods and techniques commonly used in habitat restoration work. The conservation measures proposed in the action are a collection of BMPs designed to provide the best positive impact with the least negative impacts to the aquatic systems. Third, it is assumed that the restoration activity is being applied for the explicit purpose of restoration of either watershed processes or functions, including the provision of fish and wildlife habitat. It is a goal of the FWS Division of Ecological Services to ensure that restoration projects address watershed processes and functions. Fourth, it is assumed that each restoration activity implemented is unique given land ownership, site specific conditions, and partner involvement; accordingly each activity may vary slightly from specific project descriptions provided. Fifth, in the absence of

site-specific surveys and information, presence of endangered, threatened and/or proposed species is assumed. Finally, the BMPs and conservation measures emphasize the intent of this programmatic consultation to minimize short-term negative impacts to species while undertaking restoration activities to provide long-term benefits to the affected habitats.

Additionally, the proposed action description is specific in what it does not cover also. Streambank stabilization and restoring stream morphology are not covered in this programmatic consultation. Streambank stabilization does not restore watershed processes and functions over the long term. Restoring stream morphology is an appropriate habitat restoration activity that requires considerable knowledge and information of the aquatic system and by mutual concurrence is reserved for individual project consultation at this time.

Using the above assumptions along with the project descriptions and conservation measures as a backdrop, NMFS analyzes the short-term negative impacts of project construction versus the long-term positive impacts of anadromous salmonid habitat restoration of historic habitats.

The project categories have the common goal of habitat restoration. Not all of the projects will focus on habitats used exclusively by listed salmonids. Ultimately, however, all of the project categories will have some direct or indirect positive impact to aquatic systems. As noted in the environmental baseline section an estimated 2,400 to 8,800 human-made barriers, including dikes, culverts and tide gates block passage to an estimated 3,000 to 6,000 miles of freshwater spawning and rearing habitat. Any significant contribution to reducing this number of passage barriers will have obvious long-term beneficial effects on salmonid production. Between 50% and 90% of riparian habitat has been lost or extensively modified. A 1989 report by the FWS indicated wetlands have been reduced by 33% since statehood.

During the fiscal years of 1997, 1998, and 1999 the programs addressed in this consultation implemented a total of 282 restoration projects. These projects improved or restored functions for 2,991 acres of upland/riparian/wetland habitat and 394 miles of stream habitat and reduced sediment impacts from 50.41 miles of roads. The impacts of projects completed are expected to remain consistent into the foreseeable future. The continued implementation of projects on this level will have certain short term negative impacts but also have the realistic opportunity to contribute positively to salmonid utilization of their aquatic habitats. Improving freshwater natural production and survival through restoration activities such as installing instream structures, improving secondary channel habitats, restoring wetland hydrology, or removing structural barriers (culverts) in 394 miles of stream has the potential to significantly improve salmonid populations in the long-term.

Habitat restoration projects that remove fish blockages have an obvious population impact by allowing access to unoccupied habitat. Salmonid reproduction estimates can be made based on supporting data or assumptions about the quantity (area) and quality of aquatic habitat that becomes accessible. Habitat improvement projects such as riparian planting or upland sediment reduction projects don't facilitate access to new habitats but may improve the reproductive capacity of currently occupied habitat. There is potentially a large range of population impacts that could occur from these type of projects.

Mullan et al. (1992) reported densities of 0+ chinook in the Icicle Creek Index Area ranging from .6 to 93.7/100 m². Bilby reported average salmonid densities of .4 to .8 per m² for basins in southwest Washington. (Bilby, unpublished). A report completed for the Tulalip Tribes and Snohomish County Department of Public works found that disconnection and destruction of off-channel habitat had eliminated approximately 95% of chinook salmon rearing capacity in the Snohomish River floodplain. Using information from British Columbia, the report estimates a chinook rearing density of 854 pre-smolts/hectare from floodplain ponds (Haas 2001). The multiplier effect of hundreds of miles of freshwater streams suggests a potentially significant beneficial affect from these types of projects. Using a conservative figure for salmonid rearing as reported by Bilby in small streams could still produce several thousand additional salmonids into a population. Hollowed and Wasserman (2000) reported as many as 10 million additional adult salmon per year in production capacity from correction of 8,800 blocking culverts in state waters. The additional beneficial impact of habitat access enjoyed by non-listed salmonids that none-the-less contribute to the biological integrity of the system further multiplies the positive contribution of these projects. The long-term benefit of re-establishing fish passage to these spawning and rearing habitats will, when weighed against the effects of construction with conservation measures, outweigh the short term effects of project construction.

In the short-term, work associated with some of these restoration activities could result in the disturbance of salmonids through turbidity, noise, contact (or near-contact) with equipment, compaction and disturbance of instream gravel from heavy equipment, and modification to adjacent riparian areas. Juvenile fish that may be rearing in the vicinity of the action area would most likely be displaced, although working during the in-water work period would decrease the risk of fish presence. Seven of the sixteen project categories will likely occur within bank full width, if not the wetted perimeter, of streams or near shore aquatic systems. The conservation measures or BMPs are intended to minimize or avoid the introduction of human caused sediments pulses to the aquatic environment. Several of the project categories such as collecting information, posting signs, and planting native vegetation have almost no likelihood of contributing sediment to the associated aquatic environment.

Several of the project categories have at least the potential to contribute short-term pulses of suspended sediments to the aquatic environment. The effects of suspended sediment and turbidity on fish are reported in the literature as ranging from beneficial to detrimental (see below). Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorous fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth, and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish are the season, frequency and the duration of the exposure (not just the TSS concentration).

Behavioral avoidance of turbid waters may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Birtwell *et al.* 1984, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbid plumes (McLeay *et al.* 1984, 1987, Sigler *et al.* 1984, Lloyd 1987, Scannell 1988, Servizi and Martens 1991). Juvenile salmonids

tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potentially positive reported effect is providing refuge and cover from predation (Gregory and Levings 1988).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade-off (e.g., enhanced survival) to the cost of potential physical effects (e.g., reduced growth). Turbidity levels of about 23 Nephelometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjorn and Reiser 1991). However, research indicates that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

At moderate levels, turbidity has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish. Turbidity might also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Therefore, there is a low probability of direct mortality from turbidity associated with proposed activities because the turbidity should be localized and brief, and because for most project activities the work site will have been isolated from the fish bearing waters during the construction period.

The discussion above illustrates the full range of reported impacts of suspended solids, turbidity, in the water column. The proposed action(s) will be predominately constructed in isolation from stream flow and therefore introduction and transport of sediments will be generally non-existent during construction. During re-introduction of the stream to the project site there is a likelihood for some small amount of sediment to be introduced to the water column. The effects of this will be minimal given that it will also occur in a time frame when the presence of listed species is minimized.

Instream use of heavy equipment compact and disturb stream bed gravels. Compaction and disturbance of stream bed gravels increase difficulty in redd excavation and the ability of the gravels to be aerated, resulting in lost productivity. Cederholm *et al.* (1997) recommend that heavy equipment work should be performed from the bank and that work within bedrock or

boulder/cobble bedded channels should be viewed as a last resort and that least impacting equipment such as low ground pressure equipment be utilized.

Short-term alterations to the adjacent riparian area to facilitate access to the stream result in increases in turbidity and loss of vegetation. The loss of vegetation may result in some small amount of increased solar radiation and subsequent small increase in stream temperature. These effects can be offset through compensatory mitigation.

Conservation measures in the form of BMPs integrated into projects ensure that turbidity issues will be minimized. With few exceptions the project construction activities will be conducted in isolation from flowing waters. However, even the activity needed to isolate the stream may cause at least minimal water quality impacts. It is also common that re-introduction of the stream to a newly constructed project will introduce some level of turbid waters downstream and project proposals should include a ramping of flow re-introduction to the project site to minimize this issue.

Conservation measures also direct heavy equipment to work from the banks as much as possible and to avoid entering the stream channel except to make required stream crossings in order that the gravel compaction issues discussed above are minimized or avoided.

Restoring fish passage at existing culvert crossing sites implies that road access is available and that the need for road construction and the associated impacts can be largely avoided. In the case of large fills or dependent on the engineered solution some constructed road access may be required to gain access to the culvert structure itself.

Direct and indirect effects to salmonids are likely during road construction for temporary project access within riparian areas. Earth-disturbing activities, including excavation, stockpiling, vegetation manipulation, and construction, can result in increased delivery of sediment to streams, and increase turbidity in the water column. The severity of the impact depends on numerous factors including the proximity of the action to the water, amount of ground-disturbing activity, slope, amount of vegetation removed, and weather. Sediment introduced into streams degrades spawning and incubation habitat, and can negatively affect primary and secondary productivity. This may disrupt feeding and territorial behavior through short-term exposure to turbid water.

Construction of projects near water bodies increases the risk that toxic or harmful substances fall or drain into streams and rivers. Project activities may also result in a spill of hazardous materials, including fuel, oil and grease. These can be acutely toxic to fish at high levels of exposure, and cause acute and chronic lethal or sub-lethal effects to salmonids, aquatic invertebrates, and aquatic and riparian vegetation. Similarly, NMFS notes that some of the described projects allow for the application of chemicals (herbicides) and describes the manner and location in which application may occur. NMFS does not believe that there is currently sufficient information available to ensure that such chemical applications are not creating sub-lethal affects to listed species. NMFS is currently working with Federal Agencies on an appropriate monitoring regimen when chemical application is integral to a Federal action in

order to investigate the fate and transport of these chemicals. However, NMFS believes that monitoring intensity is beyond the scope of the individual projects described in the Programmatic BA. NMFS, therefore, is not providing programmatic consultation on any projects that propose the application of chemicals; herbicides or pesticides.

B. Effects on Critical Habitat

NMFS designates critical habitat based on physical and biological features that are essential to the listed species. Essential features for designated critical habitat include substrate, water quality, water quantity, water temperature, food, riparian vegetation, access, water velocity, space and safe passage.

Effects to critical habitat from these categories are the same as those expressed in the previous section.

C. Cumulative effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Other activities within the watershed have the potential to impact fish and habitat within the action area. Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes.

Non-Federal activities of the same type identified as factors for decline by NMFS and within the action area are expected to increase with a projected 34 percent increase in human population over the next 20 years in Washington (DNR 2000). Thus, NMFS assumes that future private and State actions will continue within the action area, but at increasingly higher levels as population density climbs.

V. CONCLUSIONS

The NMFS has determined, based on the information, analysis, and assumptions described in this Opinion, that the FWS' proposed conditions (conservation measures) for the categories of restoration activities are not likely to jeopardize the continued existence of the listed salmon and steelhead shown in Table 1. In arriving at this determination, NMFS considered the status of the listed salmon and steelhead, environmental baseline conditions, the direct and indirect effects of the action, and the cumulative effects of actions anticipated in the action area. The NMFS evaluated the proposed action and found that it would cause short-term adverse degradation of some environmental baseline indicators for listed salmon and steelhead. The placement of stream isolation structures, pumps etc. will cause listed species to abandon feeding and resting sites and seek other shelter. The act of isolating the work site and removing flowing waters has the greatest probability of take as, despite, efforts to capture and transfer fish there is at least

some probability that not all fish will be successfully captured and transferred. During the re-introduction of stream flow to a completed project there is a likelihood that at least some sediments will be re-suspended and be transported to downstream habitats. Take is expected to be minimal, however, and the proposed action is not expected to result in further degradation of aquatic habitats over the long term. Thus, the effects of the proposed action would not reduce pre-spawning survival, egg-to-smolt survival, or upstream/downstream migration survival rates to a level that would appreciably diminish the likelihood of survival and recovery of proposed or listed fishes, nor is it likely to result in destruction or adverse modification of critical habitats. And the long-term effects will likely be beneficial for all the listed ESUs.

VI. REINITIATION OF CONSULTATION

Consultation must be reinitiated after five years. It also must be reinitiated if: The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16). To reinitiate consultation, FWS should contact the Habitat Conservation Division (Washington State Office) of NMFS.

VII. INCIDENTAL TAKE STATEMENT

Sections 4 (d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of Take

The NMFS anticipates that the actions covered by this Opinion are reasonably certain to result in incidental take of the species listed in Table 1. Effects of actions such as these, however, are largely unquantifiable and are not expected to be measurable as long-term effects on population levels. Therefore, even though NMFS expects some low level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species itself. In instances such as these, the NMFS designates the expected level of take as "unquantifiable." Based on the information in the proposed action, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the actions covered by this Opinion.

B. Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FWS has the continuing duty to monitor the activities covered in this incidental take statement. The NMFS believes that activities carried out in a manner consistent with these reasonable and prudent measures, except those otherwise identified, will not necessitate further site-specific consultation. Activities which do not comply with all relevant reasonable and prudent measures will require further individual consultation.

The NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize the likelihood of take of listed fish resulting from implementation of this Opinion. These reasonable and prudent measures would also minimize adverse effects to designated critical habitat.

1. Site specific activity. Minimize the likelihood of incidental take from activities seeking to restore habitat that involve; the construction of temporary access roads, use of heavy equipment, earthwork, site restoration, stream bypass systems, or that may otherwise involve in-water or over-water work or affect fish passage by applying project design conditions to avoid or minimize disturbance to riparian and aquatic systems.
2. Project reporting. Ensure the effective administration of this programmatic approach to project review and included efforts to minimize take of listed species by providing for appropriate post project reporting, monitoring and yearly review of project impacts with the Services to ensure this Opinion is meeting its objective of avoiding and/or minimizing take from the permitted activities.

C. Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, FWS must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. Site Activity Specific: Protective coverage of this incidental take statement is only applied to proposed actions within the categories of activities considered by this Opinion and limited by these terms and conditions.

- a. *Project design.* Each project will be individually reviewed to ensure that all reasonable alternatives have been considered and impacts to natural resources have been avoided, minimized and mitigated, and that the following overall project design conditions are met.

- (1) Steep Gradients. Projects in steeper gradient streams, >4%, that propose to replace a passage blocking culvert with another culvert shall provide an analysis supporting the choice of structure. Accordingly, for replacement or retrofit culverts (see exception below), applicant must provide a written analysis of the practicability of crossing removal and abandonment, bridge, and full-spanning arch or bottomless culvert that will be based on the following factors:
 - (a) The fish and wildlife habitat functions that would be lost and/or restored;
 - (b) The predicted cost associated with construction, maintenance, and repair (over the forecast life of the project);
 - (c) The risk or probability of future crossing failure or loss of fish passage due to reasonable foreseeable trends in watershed development and extreme flood events; and
 - (d) The potential contribution to maintenance or achievement of properly functioning habitat conditions for salmonids in the watershed.

EXCEPTION: The prescribed alternatives analysis is not required for bridges, arch culverts or bottomless culverts with footings located at least 1.2 times the average channel width plus two feet. The channel width shall be determined from measurements of the stream corridor up- and downstream of the crossing location but outside of the influence of the existing crossing structure. In cases where the channel width is poorly defined or indeterminate, the footings must be located at least 1.2 times the width corresponding to the 2-year recurrence interval flood plus two feet (WDFW, 1999).

- (2) Applicant shall also provide monitoring data to support that passage is occurring and accepts responsibility to ensure fish passage in perpetuity.

- (3) No herbicide application will occur as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.
- (4) Minimum area. Construction impacts will be confined to the minimum area necessary to complete the project.
- (5) In-water work. All work within the active channel of all anadromous fish-bearing streams, or in systems which could potentially contribute sediment or toxicants to downstream fish-bearing systems, will be completed within the WDFW approved in-water work period as specified in Appendix B⁴ except as modified by Individual Programmatic Biological Opinion (IPBO) responses. Actions occurring outside this window may require separate section 7 consultations. Projects requiring a state-issued Hydraulic Project Approval (HPA) will follow the included conditions and have the HPA available on site during the construction period. Conflicts between permit conditions and these terms and conditions shall be brought to the attention of WDFW, the FWS, and NMFS for resolution prior to beginning project construction.
 - (a) work period extensions. Extensions of the in-water work period, including those for work outside the wetted perimeter of the stream but below the ordinary high water mark must be approved in writing by biologists from NMFS.
- (6) Isolation of in-water work area. Except for work to install stream isolation structures, i.e. coffer dams, bypass flow devices, pumps and screens, and LWD placements all work to facilitate habitat restoration shall occur in isolation from flowing waters.
 - (a) fish screen. Any water intake structure authorized under this Opinion including pumping to isolate an in-water work area must have a fish screen installed, operated and maintained in accordance to NMFS' fish screen criteria⁵

⁴The draft work window table is under review and revision by WDFW. It is provided herein to provide notification that modification of work windows is forthcoming. NMFS expects co-manager cooperation in finalizing the work window product.

⁵National Marine Fisheries Service, *Juvenile Fish Screen Criteria* (revised February 16, 1995) and *Addendum: Juvenile fish Screen Criteria for Pump Intakes* (May 9, 1996)(guidelines and criteria for migrant fish passage facilities and new pump intakes and existing inadequate pump intake screens) (<http://www.nwr.noaa.gov/1hydroweb/ferc.htm>).

- (b) Seine and Release. Before and intermittently during pumping to isolate an in-water area, attempts will be made to seine and release fish from the work isolation area as is prudent to minimize risk of injury.
- i. Seining will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.
 - ii. ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer.
 - iii. Seined fish must be released as near as possible to capture sites.
 - iv. The transfer of any ESA-listed fish from the applicant to third parties other than NMFS personnel requires written approval from the NMFS.
 - v. The applicant must obtain any other Federal, state and local permits and authorizations necessary for the conduct of seining activities.
 - vi. The applicant must allow NMFS or its designated representative to accompany field personnel during the seining activity, and allow such representative to inspect the applicant's seining records and facilities.
 - vii. A description of any seine and release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers; the means of fish removal; the number of fish removed by species; conditions of all fish released, and any incidence of observed injury or mortality.
- (c) For projects that utilize electrofishing to remove listed species from the project area applicants shall adhere to NMFS electrofishing guidelines available for review at:
[Http://www.nwr.noaa.gov/salmon/salmesa/4ddocs/final4d/electro2000.html](http://www.nwr.noaa.gov/salmon/salmesa/4ddocs/final4d/electro2000.html)

- (d) For projects that do isolate from flowing waters with coffer dams, diversions or by some other means a ramping schedule for de-watering and re-watering shall be reviewed for adequacy by the FWS project biologist.
- (7) Pollution and Erosion Control Plan. A Pollution and Erosion Control Plan (PECP) will be developed for each authorized project to prevent point-source pollution related to construction operations. The PECP will contain the pertinent elements listed below and meet requirements of all applicable laws and regulations:
 - (a) methods that will be used to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.
 - (b) methods that will be used to confine and remove and dispose of excess concrete, cement and other mortars or bonding agents, including measures for washout facilities.
 - (c) a description of the hazardous products or materials that will be used, including inventory, storage, handling, and monitoring.
 - (d) a spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on site, proposed methods for disposal of spilled materials, and employee training for spill containment.
 - (e) measures that will be taken to prevent construction debris from falling into any aquatic habitat. Any material that falls into a stream during construction operations will be removed in a manner that has a minimum impact on the streambed and water quality.
- (8) Temporary access roads. Temporary access roads are designed as follows:
 - (a) existing roadways or travel paths will be used whenever reasonable. Project proposals to construct any access roads to a project site must receive individual project review and an IPBO from NMFS and must be accompanied by analysis supporting the need for road construction.

- (b) where stream crossings are essential, a survey must determine and map any potential spawning habitat within 1,000 feet upstream and downstream.
 - (c) no stream crossings will occur at known or suspected spawning areas or within 300 feet upstream of such areas where impacts to spawning areas may occur.
 - (d) where stream crossings are essential, the crossing design will accommodate reasonably foreseeable risks (e.g., flooding and associated bedload and debris) to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.
 - (e) vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever reasonable.
 - (f) temporary roads within 150 feet of streams will avoid, minimize and mitigate soil disturbance and compaction by clearing vegetation to ground level and placing clean road bedding, gravel or wood chips, over geotextile fabric. The fill and fabric is to be removed upon project completion, during road obliteration.
 - (g) the number of stream crossings is minimized.
- (9) Cessation of work. All project operations, except efforts to minimize storm or high flow erosion, will cease under high flow conditions that may result in inundation of the project area.
- (10) The additional project related conservation measures as proposed in the Programmatic BA are required elements of any project except as modified by these terms and conditions.
- (11) Integrated Streambank Protection Guidelines (ISPG). Projects proposing to use bank stabilization at crossing structures, revegetate at streambank grading sites, place stream bed controls or otherwise impact the natural erosional patterns of the stream shall incorporate, and demonstrate in a written description, the site design fundamentals of WDFW's ISPG available for review and download at: <http://www.wa.gov/wdfw/hab/ahg/ispdoc.html>.
- (12) When a project involves work on a tide gate NMFS will have 30 days to review the replacement of tide gates which are designed to enhance fish passage.* Review of proposed projects will include relative improvement from baseline conditions. Projects will be designed to maximize the time adult and juvenile fish are able to traverse through the structure throughout the tidal cycle and/or river stage while maintaining flood control intent. Some projects

may be able to further enhance passage in critical times of the year (i.e. periods of adult migration and juvenile outmigration/rearing). (* Projects that document to FWS that passage can occur through 90% of the tide cycle or 90% of river stage in non-tidal areas do not require 30 day review period.)

- (13) Project category number 14, install/modify fish passage structures, of the proposed action

b. *Pre-construction activities.* Before significant alteration of the project area, the following actions will be accomplished.

- (1) Boundaries of the clearing limits associated with site access and construction are flagged to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.
- (2) The following emergency erosion control materials are onsite:
 - (a) a supply of erosion control materials (e.g., silt fence and straw bales) is on hand to respond to sediment emergencies. Certified weed free straw or hay bales will be used when available to prevent introduction of noxious weeds.
 - (b) an oil absorbing, floating boom is available on-site during all phases of construction whenever surface water is present.
- (3) All temporary erosion controls (e.g., straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the project, and will remain and be maintained until such time that permanent erosion control measures are effective.

c. *Heavy Equipment.* Heavy equipment use will be restricted as follows.

- (1) When heavy equipment is required, the applicant will use equipment having the least impact necessary to accomplish the authorized work (e.g. low ground pressure, minimally sized, rubber tired).
- (2) Heavy equipment will be fueled, maintained and stored as follows:

- (a) all equipment that is used for instream work will be cleaned before beginning operations below the bankfull elevation. External oil and grease will be removed, along with dirt and mud. No wash and rinse water will be discharged into streams and rivers without adequate treatment to meet state water quality standards before reaching a receiving water..
 - (b) place vehicle staging, cleaning, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from any stream.
 - (c) all vehicles operated within 150 feet of any stream or water body will be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected will be repaired in the vehicle staging area before the vehicle resumes operation.
 - (d) when not in use, vehicles will be stored in the vehicle staging area.
 - (e) oil-absorbent pads and personnel trained in spill prevention and control will be present during equipment operations.
- d. *Site preparation.* Site preparation is completed in the following manner, including removal of stream materials, topsoil, surface vegetation and major root systems.
 - (1) Any instream large wood or riparian vegetation that is moved or altered during construction will stay on site or be replaced with a functional equivalent.
 - (2) Clearing and grubbing within 150 feet of any stream occupied by listed salmonids during any part of the year, or within 50 feet of any stream not occupied by listed salmonids shall be the minimum necessary to accomplish the project.
 - (3) Tree removal will be strictly limited.
 - (a) all perennial and intermittent streams: No tree 6 inches diameter at breast height (dbh) or greater will be removed from within 50 feet horizontal distance of the ordinary high water mark.
 - (b) on any stream supporting a listed salmonid: No more than 5 trees 6 inches dbh or greater total may be removed from the area spanning 50 feet to 150 feet horizontal distance from the ordinary high water mark.
 - (c) all tree removal will be mitigated for onsite by a 2:1 replanting ratio.

- (d) whenever the project area is to be revegetated or restored, native channel material, topsoil and native vegetation removed for the project should be stockpiled for redistribution on the project area.
- e. *Earthwork.* Earthwork, including drilling, blasting, excavation, dredging, filling and compacting, is completed in the following manner:
 - (1) Boulders, rock, woody materials and other natural construction materials used for the project must be obtained from outside of the riparian area.
 - (2) During excavation, native streambed materials will be stockpiled above the bankfull elevation, where it cannot reenter the stream, for later use. If invert protecting rip rap has been placed, native materials will be placed over the top of the rip rap and revegetated.
 - (3) Stream bank grading shall be the minimum necessary to revegetate and restore bank lines disturbed in the course of conducting the project activity.
 - (4) To minimize the duration of area exposed, projects will be completed as quickly as possible without compromising the quality of work and disturbed areas shall be stabilized within 3 days of the end of construction.
 - (a) temporary and permanent cover measures shall be provided to protect disturbed areas (e.g. erosion control and blankets, plastic covering, mulching, seeding⁶, or sodding). Temporary cover shall be installed if any cleared or graded area is to remain un-worked for more than seven days from June 1 - Sept. 30; and for more than two days from Oct. 1 - may 31. Temporary cover shall be completed within 12 hours of cessation of work in areas that will remain un-worked for the specified time periods. As long as the covering remains in place, planting or seeding is not required in covered areas until conditions are appropriate for growth.
 - (b) all disturbed areas will be re-planted with native vegetation within three days of the end of construction, unless covered or otherwise stabilized with appropriate erosion and

⁶ By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is located, shall be used.

sediment control measures. Planting shall be completed no later than April 15 of the year following construction.

- (5) All erosion control devices will be inspected during construction to ensure that they are working adequately.
 - (a) erosion control devices will be inspected daily during the rainy season, weekly during the dry season.
 - (b) if inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.
 - (c) erosion control measures will be judged ineffective when turbidity plumes resulting from proposed activities are evident.
- (6) The amount of disturbed area shall be limited to that for which soil erosion sedimentation resulting from construction activities can be controlled.
- (7) Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control.

f. *Site restoration.* Site restoration and clean-up, including protection of bare earth by seeding, planting, mulching and fertilizing, is done in the following manner.

- (1) All damaged areas will be restored to pre-work conditions including restoration of original stream bank lines, and contours.
- (2) All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized at finished grade with mulch, native herbaceous seeding before October 1. (Native woody vegetation will be planted before April 15) On cut slopes steeper than 1v:2h, a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, 1v:2h a hydro-mulch will be applied at 1.5 times the normal rate.
- (3) Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is located, and will comprise a diverse assemblage of woody and herbaceous species.
- (4) Plantings will be arranged randomly within the revegetation area.

- (5) All plantings will be completed before April 15.
- (6) No surface application of fertilizer will be used within 50 feet of any stream channel as part of this permitted action.
- (7) Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
 - (a) plantings will achieve an 80 percent survival success after three years.
 - (b) if success standard has not been achieved after 3 years, the applicant will submit an alternative plan to the FWS. The alternative plan will address temporal loss of function.
 - (c) plant establishment monitoring will continue and plans will be submitted to the FWS until site restoration success has been achieved.

g. *Monitoring for Fish Passage Conditions.* Monitoring for Fish Passage Conditions: Culvert replacements and modifications will be monitored by qualified personnel for passage of the target fish species and life history stage during summer, high (greater than or equal to the 5-year flow event) and bankfull discharge or for six years, whichever is sooner. Monitoring shall document the hydraulic conditions (depth; velocity; elevation drop at inlet, outlet, and within the culvert/under the bridge) around and through the structure at each of the stated flow thresholds. In the event that the project does not meet the duration, velocity, flow, depth, and elevation drop standards to allow passage of the target fish species and life history stage, the permittee shall implement corrective actions necessary to allow fish passage of the target species at the project site.

2. Project Reporting: Protective coverage of this incidental take statement is only applied to proposed actions within the categories of activities considered by this Opinion and limited by these terms and conditions.

- a. *Project reporting.* Project reporting shall contain the following information:
 - (1) Isolation of in-water work area. All projects involving isolation of in-water work areas must include a report of any seine, electroshocking, and release activity including:
 - (a) The name and address of the supervisory fish biologist;
 - (b) methods used to isolate the work area and minimize disturbances to ESA-listed species;
 - (c) stream conditions prior to and following placement and removal of barriers;
 - (d) the means of fish removal;

- (e) the number of fish removed by species;
 - (f) the location and condition of all fish released;
 - (g) any incidence of observed injury or mortality; and
 - (h) starting and ending dates for work performed under the permit.
- (2) Pollution and erosion control. Copies of all pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.
- (3) Site restoration. Documentation of the following conditions:
 - (a) Finished grade slopes and elevations.
 - (b) Log and rock structure elevations, orientation, and anchoring, if any.
 - (c) Planting composition and density.
 - (d) A plan to inspect and, if necessary, replace failed plantings and structures for a period of five years.
- (4) A narrative assessment of the project's effects on natural stream function.
- (5) Photographic documentation of environmental conditions at the project site and compensatory mitigation site(s) (if any) before, during and after project completion.
 - (a) Photographs will include general project location views and close-ups showing details of the project area and project, including pre and post construction.
 - (b) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
 - (c) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.
- b. *Annual monitoring report.* By January 31 of each year, the FWS will provide the NMFS with an annual monitoring report that describes the FWS' achievements carrying out this Opinion through the permitting program for the categories of activities. This report will summarize project identification data, with special attention to projects featuring instream structures, restoration of wetland hydrology, removal of

structural barriers, modification of fish passage structures, and provide an assessment of program activities.

- (1) Project level data for all permits issued under this Opinion will be summarized in an electronic spread sheet containing the following information:
 - (a) Project name;
 - (b) applicant's name;
 - (c) category of activity under which the permit was issued;
 - (d) location by 5th field hydrological unit code (HUC), river mile and latlong; and
 - (e) the FWS contact person.
- (2) The NMFS is particularly interested in an accounting of projects that required a supporting analysis, i.e., erosion control, road crossings, temporary road construction, discharge and excavations activities. For those projects, provide a summary of supporting analyses by 5th field HUC in a separate part of the monitoring report.
- (3) In addition to project level data, the monitoring report will include an overall assessment of all FWS funded activities by categories of action considered in this Opinion during the previous year, including an evaluation of:
 - (a) the number of projects authorized by the programmatic;
 - (b) the quality of supporting analyses required for individual actions involving erosion control, stream crossings, debris jam removal, temporary road construction;
 - (c) the quality of monitoring information provided by funded projects;
 - (d) the quantity and quality of compensatory mitigation completed by project applicants;
 - (e) trends in the environmental baseline by 5th HUC as a result of activities permitted under this Opinion; and
 - (f) recommendations to improve the effectiveness of the program.
- (4) The annual report will be submitted to:
Branch Chief - Washington Branch
National Marine Fisheries Service
Attn: WSB-01-197
510 Desmond Dr. SE
Lacey, WA 98503

- c. The FWS will meet with NMFS by March 31 each year to discuss the monitoring report and any actions that may be necessary to make the program more effective.
- d. The FWS will reinstitute formal consultation on the categories of actions authorized by this Opinion within five years of the date of issuance. This term and condition is in addition to reinstitution requirements described in section VI, above.

VIII. CONSERVATION RECOMMENDATIONS

Section 7 (a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information. NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be carried out by the FWS:

1. To the greatest extent possible, the FWS should develop a database that consists of all existing projects in these categories (and the categories of subsequent phases of this programmatic document). The database should be compatible with monitoring information that will be produced to meet the requirements of this Opinion. Thus each project entered into the database should be identified by 5th field hydrological unit code (HUC), and contain, where possible, the following information: 1) project name; 2) applicant name; 3) the category of activity under which the project was funded; 4) location by river mile and latlong; 5) starting and ending dates for work done under the permit; and 6) the FWS contact person.
2. The FWS should invite tribal participation in the annual reviews of projects authorized by this programmatic consultation.

NMFS believes this information will help to reduce uncertainty about the effects of past and ongoing human and natural factors leading to the status of listed salmon and steelhead, their habitats, and the aquatic ecosystem within the bounds of the FWS offices that are working with project applicants.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed salmon and steelhead or their habitats, NMFS requests notification of the achievement of any conservation recommendations when the FWS submits its annual report describing achievements of the permitting process for the fifteen categories of activities during the previous year.

IX. ESSENTIAL FISH HABITAT CONSULTATION

A. Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH (§305(b)(4)(A));
- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies regarding any activity that may adversely affect EFH, regardless of its location.

The objective of this Essential Fish Habitat (EFH) consultation is to determine whether the proposed action may adversely affect designated EFH, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed action.

B. Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and longstanding, naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years)(PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to The Pacific Coast Groundfish Management Plan (PFMC 1998a) and the NMFS Essential Fish Habitat for West Coast Groundfish Appendix (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the Coastal Pelagic Species Fishery Management Plan (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts to these species' EFH from the proposed action is based, in part, on this information.

C. Proposed Actions

The proposed action and action area are detailed above in Sections I and II of this Opinion. The action area includes habitats that have been designated as EFH for various life-history stages of 19 species of groundfish, four coastal pelagic species, and three species of Pacific salmon (Table 2).

D. Effects of Proposed Action

As described in detail in Section IV of this Opinion, the proposed actions may result in detrimental short- and long-term impacts to a variety of habitat parameters. These adverse effects include:

1. Short-term increases in suspended sediment and turbidity;
2. Compaction and disturbance of instream gravel from heavy equipment;

3. Disturbance of the riparian habitat may result in loss of LWD recruitment, loss of shade and cover (increased water temperatures), loss of habitat complexity and decreased floodplain interactions;
4. Delivery of toxic or harmful substances into the waterway; and
5. Increased peak flows and reduced summer flows in rivers and streams due to the channelization of surface and shallow sub-surface flows;

E. Conclusion

NMFS believes that the proposed action may adversely impact the EFH for the groundfish, coastal pelagic, and Pacific salmon species listed in Table 2.

F. EFH Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA, NMFS is required to provide EFH conservation recommendations to Federal agencies regarding actions which may adversely affect EFH. While NMFS assumes that the BMPs described in the Opinion will be implemented by the FWS, it does not believe that these measures are sufficient to address the adverse impacts to EFH described above. However, most of the Terms and Conditions outlined in Section VII are generally applicable to designated EFH for the species listed in Table 2 and address these adverse effects. Consequently, NMFS recommends all of the Terms and Conditions, with the exception of Term and Condition A1a, be adopted as EFH conservation measures. If implemented by the FWS, these measures will minimize the potential adverse impacts of the proposed project and conserve EFH.

G. Statutory Response Requirement

Please note that the MSA and 50 CFR 600.920(j) require the Federal agency to provide a written response to NMFS' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. In the case of a response that is inconsistent with the EFH Conservation Recommendations, the response must explain the reasons for not following the recommendations, including the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

H. Supplemental Consultation

The FWS must reinitiate EFH consultation with NMFS if any of the proposed actions are substantially revised in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations (50 CFR 600.920(k)).

Table 2. Species of fishes with designated EFH that may occur in the project areas. Taken from Casillas, et al., 1998, PFMC 1998b, PFMC 1999.

Groundfish Species	Sablefish <i>Anoplopoma fimbria</i>	Coastal Pelagic Species
Soupin Shark <i>Galeorhinus galeus</i>	Black Rockfish <i>Sebastes melanops</i>	Anchovy <i>Engraulis mordax</i>
Spiny Dogfish <i>Squalus acanthias</i>	Bocaccio <i>S. paucispinis</i>	Pacific Sardine <i>Sardinops sagax</i>
California Skate <i>R. inornata</i>	Brown Rockfish <i>S. auriculatus</i>	Pacific mackerel <i>Scomber japonicus</i>
Ratfish <i>Hydrolagus colliei</i>	Copper Rockfish <i>S. caurinus</i>	Market Squid <i>Loligo opalescens</i>
Lingcod <i>Ophiodon elongatus</i>	Quillback Rockfish <i>S. maliger</i>	
Cabezon <i>Scorpaenichthys marmoratus</i>	English Sole <i>Parophrys vetulus</i>	Pacific Salmon Species
Kelp Greenling <i>Hexagrammos decagrammus</i>	Pacific Sanddab <i>Citharichthys sordidus</i>	Chinook salmon <i>Oncorhynchus tshawytscha</i>
Pacific Cod <i>Gadus macrocephalus</i>	Rex Sole <i>Glyptocephalus zachirus</i>	Coho salmon <i>O. kisutch</i>
Pacific Whiting (Hake) <i>Merluccius productus</i>	Starry Flounder <i>Platichthys stellatus</i>	Puget Sound pink salmon <i>O. gorbuscha</i>

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APPENDIX A
Project Tiered Review
Appendix G

APPENDIX G -Programmatic Biological Assessment Consistency Form for USFWS Restoration Activities

To use this form: For implementation guidelines and requirements, see Chapter I, Section C of the USFWS Programmatic Biological Assessment (BA) for Habitat Restoration Activities, dated XXXXXX. Provide information for every item by circling, filling in, or attaching information - as appropriate. Effect determinations must be consistent with the BA, unless less conservative calls and/or deviations are adequately documented in the notes. Effects determinations that are less conservative than prescribed by the BA should be indicated in parentheses next to the BA-prescribed effect determination for the species.

General Information

Restoration Program: _____ Restoration Biologist: _____

Date: _____ Project Name/#: _____

Species List #: _____

FWS X-REF: _____

Project Specific Information

Watershed/WRIA: _____ County: _____

HUC: _____

Document Basis of Feasibility Determination e.g., information used - watershed analysis, limiting factor analysis, etc.):

Restoration Activities:

- ☐ 1. Install instream structures
- ☐ 2. Improve secondary channel habitats
- ☐ 3. Reduce upland sediment production/delivery
- ☐ 4. Restore wetland hydrology
- ☐ 5. Install/develop upland wildlife structures
- ☐ 6. Reduce livestock impacts
- ☐ 7. Improve road/trail conditions
- ☐ 8. Plant native vegetation
- ☐ 9. Apply silvicultural treatments
- ☐ 10. Promote native vegetation growth
- ☐ 11. Remove/setback hydraulic constrictions
- ☐ 12. Remove structural barriers
- ☐ 13. Collect information/monitor
- ☐ 14. Control non-native invasive aquatic animals
- ☐ 15. Install/modify fish passage structures
- ☐ 16. Install signs
- ☐ 17. Deploy salmon carcasses

Project Description (or Attach) *List all permanent and temporary project features, including on-site and interrelated off-site activities:*

Quantify footprint of activity:_____

Quantify area affected by activity (*beneficially and adversely*):_____

Quantify area restored by restoration activity:_____

Project start date:_____ Project end date:_____

Total # days of project implementation:_____

Total # days activity above ambient noise: ____ beginning _____ ending _____

All 18 General BMPs apply

Specific BMPs which apply: 19__ 20__ 21__ 22__ 23__ 24__ 25__ 26__ 27__
28__ 29__ 30__ 31__ 32__ 33__ 34__ 35__ 36__ 37__ None__

EFFECT DETERMINATIONS, NON-FISH SPECIES

(Species found across the State are indicated by "E-W"; species found only in western Washington are indicated by a "W", and species found only in eastern Washington are indicated by an "E". You must include all species presented here). Please include species presence or absence documentation and population information in the Notes section, along with documentation for non-implementation of conservation measures..

(Note "vicinity of activity" generally equals a 1 mile radius around the project site)

Endangered Animals

W 1. Brown pelican (*Pelecanus occidentalis*)

- a) On species list? No ___ Yes ___
- b) Species known to be in vicinity of activity? No ___ Yes ___ Not known ___
- c) Activity will alter islands in Grays Harbor or Willapa Bay? No ___ Yes ___ If Yes, apply BP1.
- d) Activity will use explosives? No ___ Yes ___ If Yes above, and Yes here, apply BP2.

Notes:

Conservation Measures to be applied: BP1 ___ BP2 ___ None ___

Effect Determination: _____ brown pelicans

W 2. Columbian white-tailed deer (*Odocoileus virginianus leucurus*)

- a) On species list? No ___ Yes ___
- b) Activity in Wahkiakum County? No ___ Yes ___ If Yes, apply CWTD1.
- c) Activity installs fencing? No ___ Yes ___ If Yes above, and Yes here, apply CWTD2.

Notes:

Conservation Measures to be applied: CWTD1 ___ CWTD2 ___ None ___

Effect Determination: _____ Columbian white-tailed deer

E-W 3. Gray wolf (*Canis lupus*)

- a) On species list? No ___ Yes ___
- b) Species known to be in vicinity of activity? No ___ Yes ___ Not known ___
- c) Activity will generate above ambient noise within 0.25 mi (1.0 mi for blasting) of known den or rendezvous site? No ___ Yes ___ If Yes, apply GW1.
- d) Activity will generate above ambient noise within 0.25 mi (1.0 mi for blasting) of occupied ungulate winter habitat or ungulate calving, fawning, kidding grounds? No ___ Yes ___ If Yes, apply GW2.
- e) Activity will increase road density within potential gray wolf habitat? No ___ Yes ___ If Yes, apply GW3.

Notes:

Conservation Measures to be applied: GW1 ___ GW2 ___ GW3 ___ None ___

Effect Determination: _____ gray wolves

NOTE - we should be able to remove Peregrines as they are not listed any longer!!!

E-W 4. Peregrine falcon (*Falco peregrinus*)

- a) On species list? No ___ Yes ___
- b) Species known to be in vicinity of activity? No ___ Yes ___ Not known ___

- c) Activity will generate above ambient noise within 0.5 mi. (2.0 mi. for blasting) of occupied nesting habitat? No___ Yes___ If Yes, apply PF1.
 d) Activity will alter cliffs over 75 feet in height? No___ Yes___ If Yes, apply PF2.
 e) Activity will occur within 0.5 mi. (2.0 mi. if blasting) of a major estuary? No___ Yes___ If Yes, apply PF3.

Notes:

Conservation Measures to be applied: PF1___ PF2___ PF3___ None___

Effect Determination: _____ peregrine falcons

E 5. Woodland caribou (*Rangifer tarandus caribou*)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur east of the Pend Oreille River in Pend Oreille County at or above 4,000 feet, in the recovery zone? No___ Yes___ If Yes, apply WC1.

Notes:

Conservation Measures to be applied: WC1___ None___

Effect Determination: _____ woodland caribou

Endangered Plants

W 6. Arenaria paludicola (marsh sandwort)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in freshwater swamp or marsh in Pierce County? No___ Yes___ If Yes, apply MS1.

Notes:

Conservation Measures to be applied: MS1___ None___

Effect Determination: _____ marsh sandwort

W 7. Lomatium bradshawii (Bradshaw's desert-parsley)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___

Notes:

Conservation Measures to be applied: BDP1___ None___

Effect Determination: _____ Bradshaw's desert-parsley

E-W 8. Sidalcea oregana var. calva (Wenatchee Mountains checker-mallow)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in the Icicle Creek or Peshastin Creek watersheds in Chelan County? No___ Yes___ If Yes, apply WMC1.

Notes:

Conservation Measures to be applied: WMC1___ None___

Effect Determination: _____ Wenatchee Mountains checker-mallow

Threatened Animals

W 9. Aleutian Canada goose (*Branta canadensis leucopareia*)

- a) On species list? No ___ Yes ___
b) Species known to be in vicinity of activity? No ___ Yes ___ Not known ___
c) Activity will entail blasting within 1 mile of wetlands in Pacific County? No ___ Yes ___
If Yes, apply ACG1.

Notes:

Conservation Measures to be applied: ACG1 ___ None ___

Effect Determination: _____ Aleutian Canada geese

E-W 10. Bald eagle (*Haliaeetus leucocephalus*)

- a) On species list? No ___ Yes ___
b) Identify any bald eagle habitat in project vicinity:
Known/suspected nest territory ___ occupied night roost ___ key winter foraging area ___ known perch site ___ none ___
c) Activity will generate above ambient noise within 0.5 mile of a known or suspected bald eagle nest territory (0.25 mile if not within line-of-sight)? No ___ Yes ___ If Yes, apply BE1, BE3.
d) Activity will generate above ambient noise within 0.25 mile of occupied night roost or key winter foraging area? No ___ Yes ___ If Yes, apply BE2 and BE3.

Notes:

Conservation Measures to be applied: BE1 ___ BE2 ___ BE3 ___ None ___

Effect Determination: _____ bald eagles

E-W 11. Canada lynx (*Lynx canadensis*)

- a) On species list? No ___ Yes ___
b) Species known to be in vicinity of activity? No ___ Yes ___ Not known ___
c) Activity will occur in any of the following counties? Adams, Asotin, Benton, Chelan, Columbia, Cowlitz, Douglas, Ferry, Franklin, Garfield, Grant, King, Kittitas, Klickitat, Lewis, Lincoln, Okanogan, Pend Oreille, Pierce, Skagit, Skamania, Snohomish, Spokane, Stevens, Walla Walla, Whatcom, Whitman. No ___ Yes ___
d) Activity will occur in forests at or above 3,000 ft? No ___ Yes ___ If Yes in c and d, apply CL1.

Notes:

Conservation Measures to be applied: CL1 ___ None ___

Effect Determination: _____ Canada lynx

E-W 12. Grizzly bear (*Ursus arctos* = *U.a. horribilis*)

- a) On species list? No ___ Yes ___
b) If Yes, is activity located north of Interstate 90? No ___ Yes ___
c) If Yes, is activity within core area? (GIS-generated) No ___ Yes ___ If Yes, apply GB1, GB2, GB3, GB4, GB5.

d) If activity is located south of Interstate 90, is activity within 0.25 mile (1.0 for blasting) of known den site? No___ Yes___ If Yes, apply GB1.

Notes:

Conservation Measures to be applied: GB1___ GB2___ GB3___ GB4___ GB5___ None___

Effect Determination: _____ grizzly bears

E-W 13. Marbled murrelet (*Brachyramphus marmoratus*)

a) On species list? No___ Yes___

b) Suitable habitat in project vicinity? No___ Yes___ Not known___

c) Surveys to protocol conducted? No___ Yes___ Not known___

If Yes, describe results: Occupied___ Not Occupied___

d) Will activity generate noise above ambient levels within 0.25 mile (1.0 mile if blasting) of suitable nesting or foraging habitat? No___ Yes___ If Yes, apply MM1.

e) Will activity use aircraft within 0.25 mile of suitable nesting or foraging habitat? No___ Yes___

If Yes, apply MM2.

f) Will activity affect the primary constituent elements of marbled murrelet critical habitat?

No___ Yes___ If Yes, apply MMCH1.

Notes:

Conservation Measures to be applied: MM1___ MM2___ MMCH1___ None___

Effect Determination: _____ marbled murrelets

Effect Determination: _____ designated critical habitat for the marbled murrelet

E-W 14. Northern spotted owl (*Strix occidentalis caurina*)

a) On species list? No___ Yes___

b) Species known to be in vicinity of activity? No___ Yes___ Not known___

c) Species habitat present in vicinity of activity: nesting or foraging habitat___ unsurveyed suitable habitat___ occupied nesting habitat___ dispersal habitat___ designated critical habitat___ none___

d) Will activity occur in nesting or foraging habitat? No___ Yes___ If Yes, apply NSO1.

e) Will activity generate above ambient noise within 0.25 mi (1.0 mi if blasting) of unsurveyed or occupied nesting habitat? No___ Yes___ If Yes, apply NSO2.

f) Will activity remove trees in dispersal habitat? No___ Yes___ If Yes, apply NSO3.

g) Will activity occur within designated critical habitat for the northern spotted owl on USFS land or on Fort Lewis land? No___ Yes___ If Yes, the programmatic does not cover this activity. If No, this activity complies with NSOCH1.

Notes:

Conservation Measures to be applied: NSO1___ NSO2___ NSO3___ NSOCH1___ None___

Effect Determination: _____ northern spotted owls

Effect Determination: _____ designated critical habitat for the northern spotted owl

W 15. Oregon silverspot butterfly (*Speyeria zerene hippolyta*)

a) On species list? No___ Yes___

b) Species known to be in vicinity of activity? No___ Yes___ Not known___

c) Activity will occur on the Long Beach peninsula in Pacific County? No___ Yes___
If Yes, apply OSB1.

Conservation Measures to be applied: OSB1___ None___

Effect Determination: _____ Oregon silverspot butterflies

W 16. Western snowy plover (*Charadrius alexandrinus nivosus*)

a) On species list? No___ Yes___

b) Western snowy plover nesting habitat known to be in vicinity of activity?

No___ Yes___ Not known___

c) Activity will occur within 0.25 mi (1.0 mi if blasting) of known nesting area? No___
Yes___ If Yes, apply WSP1.

d) Proposed critical habitat for the western snowy plover on species list? No___ Yes___

e) Species known to be in vicinity of activity? No___ Yes___ Not known___

f) Activity will occur at Leadbetter Point, Pacific County or Damon Point, Grays Harbor
County? No___ Yes___ If Yes, apply WSPPCH1.

Notes:

Conservation Measures to be applied: WSP1___ WSPPCH1___ None___

Effect Determination: _____ western snowy plovers

Effect Determination: _____ proposed critical habitat for the western snowy plover

Threatened Plants

W 17. Castilleja levisecta (golden paintbrush)

a) On species list? No___ Yes___ If Yes, apply GP1.

Notes:

Conservation Measures to be applied: GP1___ None___

Effect Determination: _____ golden paintbrush

E-W 18. Howellia aquatilis (water howellia)

a) On species list? No___ Yes___

b) Species known to be in vicinity of activity? No___ Yes___ Not known___

c) Activity will occur in wetlands of Mason, Pierce, Thurston, Clark, or Spokane Counties?
No___ Yes___ If Yes, apply WH1.

Notes:

Conservation Measures to be applied: WH1___ None___

Effect Determination: _____ water howellia

W 19. Lupinus sulphureus ssp. kincaidii (Kincaid's lupine)

a) On species list? No___ Yes___

b) Species known to be in vicinity of activity? No___ Yes___ Not known___

c) Will activity occur in Boistfort, Lewis County? No___ Yes___ If Yes, apply KL1.

Notes:

Conservation Measures to be applied: KL1___ None___

Effect Determination: _____ Kincaid's lupine

W 20. Sidalcea nelsoniana (Nelson's checkermallow)

- a) On species list? No___ Yes___
- b) Species known to be in vicinity of activity? No___ Yes___ Not known___
- c) Activity will occur in wetlands, stream corridors, or prairies in the Willapa Hills/Coast Range in Lewis or Cowlitz Counties? No___ Yes___ If Yes, apply NC1.

Notes:

Conservation Measures to be applied: NC1___ None___

Effect Determination: _____ Nelson's checkermallow

E 21. Spiranthes diluvialis (Ute ladies'-tresses)

- a) On species list? No___ Yes___
- b) Species known to be in vicinity of activity? No___ Yes___ Not known___
- c) Activity will occur in counties east of the Cascade Crest, between 1,500 and 4,000 feet in elevation, in the grassland-dominated portion of periodically-flooded alkaline flats? No___ Yes___ If Yes, apply ULT1.

Notes:

Conservation Measures to be applied: ULT1___ None___

Effect Determination: _____ Ute ladies'-tresses

Proposed Endangered Plants

E-W 22. Hackelia venusta (Showy stickseed)

- a) On species list? No___ Yes___
- b) Species known to be in vicinity of activity? No___ Yes___ Not known___
- c) Activity will occur in Chelan County, between 300m and 2,050m in elevation, in the Ponderosa Pine zone? No___ Yes___ If Yes, apply SST1.

Notes:

Conservation Measures to be applied: SST1___ None___

Effect Determination: _____ Showy stickseed

Proposed Threatened Plants

E 23. Silene spaldingii (Spalding's silene)

- a) On species list? No___ Yes___
- b) Species known to be in vicinity of activity? No___ Yes___ Not known___
- c) Activity will occur in Asotin, Lincoln, Spokane or Whitman counties in undisturbed prairie on loessal hills at low to mid elevations? No___ Yes___ If Yes, apply SSP1.

Notes:

Conservation Measures to be applied: SSP1___ None___

Effect Determination: _____ Spalding's silene

Candidate Animals

E-W 24. Oregon spotted frog (*Rana pretiosa*)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in any of the following counties? Clark, Cowlitz, King, Klickitat, Lewis, Pierce, Skagit, Skamania, Snohomish, Thurston, Whatcom. No___ Yes___
 d) Activity will occur in wetland, sluggish stream, pond, or lake, with emergent vegetation? No___ Yes___ If Yes in c and d, apply OSF1.
 e) If Yes in d, and OSF1 applied, were indications of Oregon spotted frogs found? No___ Yes___ N/A___
 If Yes, apply OSF2.

Notes:

Conservation Measures to be applied: OSF1___ OSF2___ None___

Effect Determination: _____ Oregon spotted frog

E-W 25. Mardon skipper (*Polites mardon*)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in any of the following counties? Thurston, Pierce, Skamania, Yakima, Klickitat. No___ Yes___
 d) Activity will occur in open grasslands on glacial outwash prairies or opening and ridgetops within ponderosa pine woodlands? No___ Yes___ If yes, apply MDS1.

Notes:

Conservation Measures to be applied: MDS1___ None___

Effect Determination: _____ Mardon skipper

E 26. Washington ground squirrel (*Spermophilus washingtoni*)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in Columbia Plateau, arid, low elevation, steppe grasslands that are relatively undisturbed? No___ Yes___ If yes, apply ??? **NEED CONSERVATION MEASURE.**

Conservation Measures to be applied: ???___ None___

Effect Determination: _____ Washington ground squirrel

Candidate Plants

E 27. *Artemisia campestris* var. *wormskoldii* (northern wormwood)

- a) On species list? No___ Yes___
 b) Species known to be in vicinity of activity? No___ Yes___ Not known___
 c) Activity will occur in sandy areas along the Columbia River? No___ Yes___ If yes, apply NWW1.

Notes:

Conservation Measures to be applied: NWW1___ None___

Effect Determination: _____ Northern wormwood

E 28. *Erigeron basalticus* (basalt daisy)

- a) On species list? No___ Yes___
b) Species known to be in vicinity of activity? No___ Yes___ Not known___
c) Activity will occur in Yakima or Kittitas Counties? No___ Yes___
d) Activity will occur on or around basalt cliffs? No___ Yes___ If Yes, apply BD1.

Notes:

Conservation Measures to be applied: BD1___ None___

Effect Determination: _____ basalt daisy

E 29. *Eriogonum codium* (Umtanum desert-buckwheat)

- a) On species list? No___ Yes___
b) Species known to be in vicinity of activity? No___ Yes___ Not known___
c) Activity will occur in Benton County? No___ Yes___
d) Activity will occur on or around Umtanum Ridge on basalt flow material? No___ Yes___ If Yes, apply UDB1.

Notes:

Conservation Measures to be applied: UDB1___ None___

Effect Determination: _____ Umtanum desert-buckwheat

E 30. *Lesquerella tuplashensis* (White Bluffs bladder-pod)

- a) On species list? No___ Yes___
b) Species known to be in vicinity of activity? No___ Yes___ Not known___
c) Activity will occur in Franklin County? No___ Yes___
d) Activity will occur on or around the White Bluffs of the Columbia River? No___ Yes___ If Yes, apply WBBP1.

Notes:

Conservation Measures to be applied: WBBP1___ None___

Effect Determination: _____ White Bluff's Bladder Pod

CONCURRENCE:

Project Biologist

Date

Manager, Division of Watershed Protection and Restoration

Date

Manager, Division of Endangered Species*

Date

** FWS Endangered Species Division Manager signature required only if proposed project involves a minor deviation from Biological Assessment.*

EFFECT DETERMINATIONS, FISH SPECIES

List of evolutionarily significant units (ESUs) or distinct population segments (DPSs) (check all that apply)

Endangered

- ☐ Chinook salmon, Upper Columbia River Spring ESU (*Oncorhynchus tshawytscha*)
- ☐ Sockeye salmon, Snake River (ESU) (*Oncorhynchus nerka*)
- ☐ Steelhead trout, Upper Columbia River ESU (*Oncorhynchus mykiss*)

Threatened

- ☐ Bull trout, Coastal/Puget Sound DPS (*Salvelinus confluentus*)
- ☐ Bull trout, Columbia River DPS (*Salvelinus confluentus*)
- ☐ Chinook salmon, Lower Columbia River ESU (*Oncorhynchus tshawytscha*)
- ☐ Chinook salmon, Puget Sound ESU (*Oncorhynchus tshawytscha*)
- ☐ Chinook salmon, Snake River fall ESU (*Oncorhynchus tshawytscha*)
- ☐ Chinook salmon, Snake River spring/summer ESU (*Oncorhynchus tshawytscha*)
- ☐ Chum salmon, Columbia River ESU (*Oncorhynchus keta*)
- ☐ Chum salmon, Hood Canal summer ESU (*Oncorhynchus keta*)
- ☐ Sockeye salmon, Lake Ozette ESU (*Oncorhynchus nerka*)
- ☐ Steelhead trout, Middle Columbia River ESU (*Oncorhynchus mykiss*)
- ☐ Steelhead trout, Lower Columbia River ESU (*Oncorhynchus mykiss*)
- ☐ Steelhead trout, Snake River ESU (*Oncorhynchus mykiss*)

Designated

- ☐ Critical habitat for Lower Columbia River chinook salmon ESU
- ☐ Critical habitat for Puget Sound chinook salmon ESU
- ☐ Critical habitat for Snake River fall chinook salmon ESU
- ☐ Critical habitat for Snake River spring/summer chinook salmon ESU
- ☐ Critical habitat for Upper Columbia River spring chinook salmon ESU
- ☐ Critical habitat for Columbia River chum salmon ESU
- ☐ Critical habitat for Hood Canal summer chum salmon ESU
- ☐ Critical habitat for Lake Ozette sockeye salmon ESU
- ☐ Critical habitat for Snake River sockeye salmon ESU

Proposed Threatened

- ☐ Coastal cutthroat trout, S.W. Washington/Columbia River ESU (*Oncorhynchus clarki clarki*)

Candidate

- ☐ Coho salmon, Puget Sound/Strait of Georgia ESU (*Oncorhynchus kisutch*)
- ☐ Coho salmon, Southwest Washington/Lower Columbia River ESU (*O. kisutch*)

Effect Determination by Species (NMFS) ESU and Critical Habitat, if any:_____

- 1) Species present in the watershed?
 - a) Yes___ (go to 2)
 - b) No___ (provide or attach documentation, go to 4)
 - c) Not Known___ (assume presence, go to 2)
 - iv. Notes:
- 2) Identify species use: Spawning___ Rearing___ Migratory Corridor___ None___ Not known___
 - a) How close is this use to the restoration activity?_____
 - b) Is it upstream or downstream from the restoration activity? _____
 - c. If there is species use, provide or attach documentation, go to 3.
 - d. If there is no species use, provide or attach documentation, go to 4.
 - e. If species use is not known, assume presence, go to 3.
 - f. Notes:
- 3) Does the restoration activity require an HPA?
 - a. No___ If no, go to 4.
 - b. Yes___ If yes, apply conservation measure F1 (go to 4).
 - c. Notes:
- 4) Conservation Measures to be applied: F1___ None___
- 5) Effect Determination for species:_____
- Effect Determination for critical habitat, if any:_____

Effect Determination by Species (USFWS)

DPS: _____

- 1) Species present in the watershed?
 - a. Yes___ (go to 2)
 - b. No___ (provide or attach documentation, go to 6)
 - c. Not Known___ (assume presence, go to 2)
 - d. Notes:
- 2) Identify species use: Spawning___ Rearing___ Migratory Corridor___ None___ Not known___
 - a. How close is this use to the restoration activity?_____
 - b. Is it upstream or downstream from the restoration activity? _____
 - c. If there is species use, provide or attach documentation, go to 3.
 - d. If there is no species use, provide or attach documentation, go to 6.

- e. If species use is not known, assume presence, go to 3.
- f. Notes:

3) Does the restoration activity require an HPA?

- ii No___ If no, go to 6.
- b) Yes___ If yes, apply conservation measure F1 (go to 4).
- c) Notes:

4) Does the project occur in bull trout spawning or juvenile rearing habitats, or will instream work affect bull trout spawning or rearing habitats?

- a) No___ If no, go to 5.
- b) Yes___ If yes, apply conservation measure BT1.
- c) Unknown___ If unknown, but suitable bull trout spawning or rearing habitat is in project vicinity, apply conservation measure BT1.

5) Does the project activity involve fish passage structures (Restoration activity 14).

- ii No___
- ii Yes___ If yes, apply conservation measure BT2, and explain in notes how compliance with BT2 is achieved.
- ii Notes:

6) Conservation Measures to be applied: F1___ BT1___ BT2___ None___

7) Effect Determination: _____ bull trout

CONCURRENCE:

Project Biologist

Date

Manager, Division of Watershed Protection and Restoration

Date

Manager, Division of Endangered Species

Date

National Marine Fisheries Service

Date

APPENDIX B
In-water Work Windows

TABLE 1. ALLOWABLE ~~IN-WATER~~ WORK WINDOWS FOR HYDRAULIC PROJECTS

[illegible]

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Clallam	July 15 - September 30	Bogachiel River (20.0162) Calawah River (20.0175) Clallum River (19.0129) Dungeness River (18.0018) Elwha River (18.0272) - mouth to lower dam Hoko River (19.0148) Jimmycomelately Creek (17.0285) Lyre River (19.0031) McDonald Creek (18.0160) Morse Creek (18.0185) Pysht River (19.0113) Sekiu River (19.0203) Sol Duc River (20.0096) Sooes River (20.0015) Lake Ozette (20.0046) Lake Pleasant (20.0313)	July 15 - August 15 July 15 - August 15 July 15 - September 15 July 15 - September 15 July 1 - August 15 July 15 - September 15 July 15 - September 15 July 15 - September 15 July 1 - August 15 July 1 - August 15 July 15 - September 15 July 15 - September 15 July 15 - August 15 July 15 - September 15 May 1 - September 30 May 1 - September 30	
Clark	July 1 - September 30	Lewis River (27.0168) - mouth to East Fork Lewis River forks - East Fork Lewis River (27.0173) - mouth to Sunset Falls LaCenter Road bridge - Copper Creek (27.0275) - East Fork Lewis River (27.0173)-above Sunset Falls LaCenter - North Fork Lewis River (27.0168) - mouth confluence with East Fork Lewis River to Merwin Dam - Cedar Creek - North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls Swift Dam Lake River (28.0020) Washougal River (28.0159)	June 1 - October 31 July 15 - September 30 July 1 - October 31 July 15 - October 31 July 15 - October 31 →August 31 August 1 - August 31 August 1 - September 30 July 1 - July 31 July 1 - September 30 June 1 → October 31 August 1 - August 31	
Columbia	July 15 - October 31 <u>September 30</u> ⁵	Tucannon River (32 5 .0009) - mouth to Marengo bridge <u>Tucannon River (35.0009) - Marengo bridge to Tualum Creek</u> <u>(35.0368)</u> <u>Tucannon River (35.0009) - above Tualum Creek (35.0368)</u> Touchet River (32.0097) - mouth to Wolf Fork (32.0773) <u>Touchet River (32.0097) - above Wolf Fork (32.0773)</u>	July 15 - August <u>September</u> 15 <u>July 15 - August 31</u> <u>July 15 - August 15</u> July 15 - August 15 <u>September 30</u> <u>July 15 - August 20</u>	<u>CHF, ST</u> <u>CHSP, ST</u> <u>BT, CHSP, ST</u> <u>BT, ST</u> <u>BT, ST</u>

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Cowlitz	July 1 - September 30	Cowlitz River (26.0002) - Coweeman River (26.0003) - Toutle River (26.0227) Kalama River (27.0002) Lewis River (27.0168) - mouth to East Fork Lewis River forks - North Fork Lewis River (27.0168) - confluence with East Fork Lewis River mouth to Merwin Dam - North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls - North Fork Lewis River (27.0168) - above Lower Falls	August 1 - August 31 August 1 - September 30 July 1 - September 15 August 1 - August 31 June 1 - October 31 August 1 - August 31 July 1 - July 31 July 1 - October 31	
Douglas	July 1 - October 31	None		
Ferry	July 1 - August 31	Lakes	March 15 - May 10 and July 1 - September 30	
Franklin	June 1 - September 30	Palouse River (34.0003) - above falls	June 15 - October 15	
Garfield	July 15 - October 31 September 30 ⁵	Asotin Creek (35.1716) Tucannon River (35.0009)	July 15 - August 15 July 15 - August 15	BT, ST BT, ST
Grant	July 1 - October 31	None		
Grays Harbor	July 15 - October 31 15	Chehalis River (22.0190/23.0190) - mouth to Porter Creek - Cloquallum River (22.0501) - Satsop River (22.0360) Chehalis River (22.0190/23.0190) - above Porter Creek - Cedar Creek (23.0570) - Porter Creek (23.0543) Elk River (22.1333) Johns River (22.1270) North River (24.0034) Quinault River (21.0398)	June 1 - October 31 15 July 15 - September 30 July 15 - August 31 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 30 July 15 - September 15 July 15 - August 31	CHS
Island	June 15 - September 15	None		

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Jefferson	July 15 - October 31	Big Quilcene River (17.0012) Bogachiel River (20.0162) Chimacum Creek (17.0203) Donovan Creek (17.0115) Dosewallips River (16.0442) Duckabush River (16.0351) Dungeness River tributaries (18.0018) Hoh River (20.0422) Little Quilcene River (17.0076) Queets River Quinault River (21.0398) Salmon Creek (17.0245) Snow Creek (17.0219)	July 15 - August 31 July 15 - August 15 July 15 - August 31 July 15 - September 30 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 15 - August 15 July 15 - August 31 July 15 - August 15 July 15 - September 15 July 15 - August 15 July 15 - August 15 July 15 - August 15	
King	July 1 - September 30	Green River (Duwamish River) (09.0001) Lake Sammamish (08.0057) Lake Washington (08.LKWA) - Ship canal, Portage Bay, and Lake Union (08.0028) All Lake Washington tributaries, except - Issaquah Creek (08.0178) Snoqualmie River (07.0219) - mouth to Snoqualmie Falls - Raging River (07.0384) - Patterson Creek (07.0376) Snoqualmie River (07.0219) - Snoqualmie Falls to mouth of South Fork Snoqualmie River - North Fork Snoqualmie River (07.0527) - Middle Fork Snoqualmie River (07.0219) - South Fork Snoqualmie River (07.0467) South Fork Skykomish River (07.0012) - mouth to Sunset Falls South Fork Skykomish River (07.0012) - Sunset Falls to Alpine Falls South Fork Skykomish River (07.0012) - above Alpine Falls - Beckler River (07.1413) - mouth to Boulder Creek - Foss River (07.1562) - mouth to forks - East Fork Foss River (07.1562) - West Fork Foss River (07.1573) - Miller River (07.1329) - mouth to forks - Miller River (07.1329) - above forks Tolt River (07.0291) - mouth to forks - North Fork Tolt River (07.0291) - mouth to Yellow Creek - North Fork Tolt River (07.0291) - above Yellow Creek - South Fork Tolt River (07.0302) - mouth to dam - South Fork Tolt River (07.0302) - above dam White River (10.0031)	August 1 - August 31 July 1 - August 15 June 16 - October 31 July 1 - August 15 June 16 - October 31 July 1 - March 31 July 1 - August 31 June 15 - July 31 July 1 - September 15 July 15 - August 31 June 15 - September 30 June 15 - October 31 July 15 - October 31 July 15 - October 31 July 15 - October 31 July 1 - August 31 July 1 - September 15 July 15 - October 31 July 1 - September 15 July 15 - September 15 July 15 - September 30 July 15 - October 31 July 1 - September 15 July 1 - October 31 July 15 - October 31 July 15 - September 15 July 15 - October 31 July 15 - September 15 July 15 - October 31 July 15 - August 31	CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, SO, ST CH, CO, ST CO, ST

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Kittitas	June 1 - September 30	Colockum Creek (40.0760) Yakima River (39.0002) - Roza Dam to Teanaway River - Teanaway River (39.1236) Yakima River (39.0002) - above Teanaway River - Gold Creek (Lake Keechelus) (39.1842) - Kachess River (39.1739) - above Lake Kachess - Box Canyon Creek (Lake Kachess) (39.1765) - Little Naches River (38.0852) - Wenas Creek (39.0032) - Other Yakima River tributaries	July 1 - October 31 July 1 - August 31 August 1 - August 31 August 1 - August 31 July 1 - July 31 July 1 - July 31 July 1 - July 31 July 15 - August 15 August 1 - October 31 July 15 - August 31	
Kitsap	July 15 - October 31	Seabeck Creek (15.0400) Gorst Creek (15.0216)	July 15 - August 31 July 15 - August 31	
Klickitat	June 15 - September 30	Klickitat River (30.0002) - mouth to Klickitat hatchery Klickitat River (30.0002) - above Klickitat hatchery White Salmon River (29.0160)	June 15 - August 15 June 15 - August 1 June 15 - August 15	CHSP CHSP
Lewis	July 1 - September 30	Chehalis River (22.0190/23.0190) - upstream of South Fork Chehalis River confluence - Newaukum River (23.0882) - Skookumchuck River (23.0761) Cowlitz River (26.0002) - Cispus River (26.0668) - mouth to Walupt Creek - Yellowjacket Creek (26.0757) - McCoy Creek (26.0766) - mouth to lower falls - McCoy Creek (26.0766) - above lower falls - Cispus River (26.0668) - above Walupt Creek - Walupt Creek (26.1010) - Tilton River (26.0560) - Packwood Lake tributaries Nisqually River (11.0008) - above Alder Lake Toutle River (26.0227)	July 1 - August 31 July 1 - August 31 July 1 - August 31 August 1 - August 31 August 1 - August 31 August 1 - September 30 August 1 - September 30 August 1 - October 31 July 15 - September 30 July 30 - September 30 August 1 - September 30 July 30 - September 30 July 1 - September 30 July 1 - September 15	CHSP CHSP CHSP
Lincoln	June 15 - October 15	None		

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Mason	July 15 - October 31	Cloquallum Creek (22.0501) Coulter Creek (15.0002) Hamma Hamma River (16.0251) - mouth to falls - John Creek (16.0253) Johns Creek (14.0049) Lilliwaup River (16.0230) - below falls Lilliwaup River (16.0230) - above falls Mill Creek (14.0029) Satsop River (22.0360) Schaerer Creek (16.0326) Sherwood Creek (14.0094) Skokomish River (16.0001) Tahuya River (15.0446) Twanoh Creek (14.0134) Union River (15.0503)	July 15 - September 30 July 15 - September 15 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 15 - August 31 July 1 - October 31 July 15 - October 15 July 15 - August 31 July 15 - August 31 July 15 - September 15 July 15 - September 15 July 15 - September 15 June 15- October 31 June 15- September 15	CHS
Okanogan	July 1 - August 15	Aneas Creek (49.0243) - mouth to falls Chewiliken Creek (49.0232) - mouth to falls Chiliwist Creek (49.0034) - mouth to falls Methow River (48.0007) - mouth to Carleton Mosquito Creek (49.0321) Nine Mile Creek (49.0516) Omak Creek (49.0138) - mouth to falls Similkameen River (49.0325) - mainstem - Similkameen River (49.0325) tributaries Tunk Creek (49.0211) - mouth to falls Lake Osooyos (49.0019)	July 1 - October 31 July 1 - October 31 July 1 - October 31 July 1 - September 30 July 1 - October 31 July 1 - October 31 July 1 - October 31 July 1 - October 31 July 1 - September 30 July 1 - August 15 July 1 - October 31 July 1 - September 30	
Pacific	July 15 - September 30	Chehalis River (22.0190/23.0190) Chinook River (24.MISC) Grays River (25.0093) Naselle River (24.0543) North River (24.0034)	July 1 - August 31 August 1 - August 31 August 1 - September 30 July 1 - August 31 July 15 - September 15	CHSP CHF

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Pend Oreille	July 1 - August 31	Big Muddy Creek (62.0279) Bracket Creek (62.0815) Calispel Creek (62.0628) - mouth to Calispel Lake Exposure Creek (62.0261) Kent Creek (62.0819) Lime Creek (62.0014) Little Spokane River (55.0003) Lodge Creek (62.0859) Marshall Creek (62.0842) Pee Wee Creek (62.0007) - above falls Renshaw Creek (62.0310) Lakes	June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 1 - August 31 June 15 - August 31 June 1 - August 31 June 1 - August 31 June 1 - October 31 June 1 - August 31 March 15 - May 10 and July 1 - September 30	
Pierce	July 15 - August 31	Nisqually River (11.0008) - mouth to Alder Lake - tributaries below Alder Lake Nisqually River (11.0008) - above Alder Lake and tributaries Carbon River (10.0413) - South Prairie Creek (10.0429) - mouth to Forest Service road #7710 - South Prairie Creek (10.0429) - above Forest Service road #7710 - Wilkeson Creek (10.0432) - mouth to Snell Lake - Wilkeson Creek (10.0432) - above Snell Lake - Voight Creek (10.0414) - mouth to falls - Voight Creek (10.0414) - above falls Rocky Creek (15.0015)	July 1 - August 31 July 1 - September 15 July 15 - September 15 July 15 - August 31 July 15 - September 15 July 1 - October 31 July 1 - September 30 July 1 - October 31 July 15 - September 15 July 15 - October 31 July 15 - September 30	
San Juan	June 1 - August 31	None		
Skagit	July 1 - September 30	Baker River (04.0435) - mouth to dam Samish River (03.005) - below hatchery rack Samish River (03.005) - above hatchery rack Skagit River (03.0176/04.0176) - mouth to Sauk River (04.0673) Skagit River (03.0176/04.0176) - above Sauk River to Newhalem Creek (04.1902) - Cascade River (04.1411) - Illabot Creek (04.1346) - Sauk River (04.0673) - Suiattle River (04.0710) Skagit River (03.0176/04.0176) - above Newhalem Creek (04.1902) Nooksack River (01.0120) - South Fork Nooksack River (01.0246)	June 15 - July 31 June 15 - August 15 June 15 - September 30 June 15 - August 31 June 15 - July 31 July 15 - July 31 June 15 - July 15 Site specific June 15 - July 31 July 15 - July 31 July 15 - August 15 July 15 - August 15 June 15 - July 31 June 15 - August 15 July 15 - August 15	STW; T STW; T STW; T BT; T; STS STS, T

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Skamania	July 1 - September 30	Cispus River (26.0668) - Yellowjacket Creek (26.0757) - McCoy Creek (26.0766) - mouth to lower falls - McCoy Creek (26.0766) - above lower falls East Fork Lewis River (27.0173) - below Sunset Falls - Copper Creek (27.0275) - East Fork Lewis River (27.0173) - above Sunset Falls North Fork Lewis River (27.0168) - Merwin Dam to Lower Falls - Cougar Creek (27.0479) North Fork Lewis River (27.0168) - above Lower Falls Little White Salmon River (29.0131) Washougal River (28.0159) White Salmon River (29.0160) Wind River (29.0023)	August 1 - August 31 August 1 - September 30 August 1 - September 30 August 1 - October 31 July 15 - September 30 August 31 July 15 - October 31 July 15 - October 31 July 1 - July 31 July 1 - July 31 July 15 - October 31 July 1 - August 31 August 1 - August 31 July 1 - August 31 August 1 - August 15	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Spokane	June 15 - August 31	Latah Creek (56.0003) - mainstem - tributaries Lakes	June 15 - October 31 June 15 - August 31 March 15 - May 10 and July 1 - September 30	
Stevens	July 1 - August 31	Big Sheep Creek (61.0150) - mouth to Sheep Creek Falls Big Sheep Creek (61.0150) - above Sheep Creek Falls Lakes	???????????? July 1 - August 31 March 15 - May 10 and July 1 - September 30	
Thurston	July 15 - September 15	Cedar Creek (23.0570) Little Deschutes River (13.0110) McLane Creek (13.0138) Nisqually River (11.0008) - mainstem - Nisqually River tributaries Porter Creek (23.0543) Schneider Creek (14.0009) Skookumchuck River (23.0761) Woodard Creek (13.0012) Woodland Creek (13.0006)	July 15 - September 30 July 15 - October 31 July 15 - October 31 July 1 - August 31 July 1 - September 15 July 15 - September 30 July 1 - October 31 July 1 - August 31 July 1 - October 31 July 1 - October 31	CHF CHF
Wahkiakum	July 15 - September 15	Elochoman River (25.0236) Grays River (25.0093) Naselle River (24.0543)	August 1 - September 30 August 1 - September 30 July 15 - September 30	
Walla Walla	July 15 - October 31 <u>September 30</u> ⁵	Walla Walla River (32.0008)	July 15 - August 15	BT, CHSP, ST

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Whatcom	July 1 - September 30	<p>Nooksack River (01.0120) - mouth to Mt Baker Hwy Bridge</p> <p>Nooksack River (01.0120) - Mt Baker Hwy Bridge to forks</p> <ul style="list-style-type: none"> - North Fork Nooksack River (01.0120) - mouth to Nooksack Falls - North Fork Nooksack River (01.0120) - above Nooksack Falls - Middle Fork Nooksack River (01.0339) - mouth to City of Bellingham diversion dam - Middle Fork Nooksack River (01.0339) -above City of Bellingham diversion dam - South Fork Nooksack River (01.0246) <p>Samish River (03.0005)</p> <p>Skagit River (03.0176/04.0176)</p> <ul style="list-style-type: none"> - Baker River (04.0435) - Ross Lake tributaries - Canyon Creek - Ruby Creek - Slate Creek - mouth to Slate Creek Falls - Slate Creek - above Slate Creek Falls 	<p>June 15 - August 31 in odd years only; June 15 - September 30 in even years only June 15 - August 15 June 15 - July 31 <u>July 15 - July 31</u> July 1 - September 30 June 15 - July 31 <u>July 15 - July 31</u></p> <p>July 1 - September 30</p> <p>June 15 - August 15 <u>July 15 - August 15</u> June 15 - September 30 June 15 - July 31 <u>July 15 - July 31</u> July 1 - September 30</p> <p>August 1 - September 30 August 1 - September 30 August 1 - September 30 July 1 - September 30</p>	<p>STW</p> <p>STW</p> <p>STW</p> <p>STW</p>
Whitman	June 15 - October 15	Palouse River (34.0003) - mouth to falls	June 1 - September 30	
Yakima	June 1 - September 30	<p>Klickitat River (30.0002)</p> <p>Yakima River (37.0002/38.0002/39.0002) - mouth to Roza Dam</p> <p><u>- Ahtanum Creek (37.1382)</u></p> <ul style="list-style-type: none"> - Naches River (38.0003) - mouth to Tieton River - Tieton River (38.0166) - Indian Creek (Rimrock Lake) (38.0302) - Naches River (38.0003) - above confluence of Tieton River - Bumping River (38.0998) - American River (38.1000) - Little Naches River (38.0852) - Rattlesnake Creek (38.0518) - Wenas Creek (39.0032) - other Yakima River tributaries 	<p>July 1 - August 15 <u>June 15 - August 1</u> June 1 - September 15 <u>July 1 - August 15</u> June 1 - October 31 June 1 - August 15 July 1 - July 31 June 1 - August 15 July 15 - August 15 July 1 - July 15 July 15 - August 15 July 15 - August 15 August 1 - October 31 July 15 - August 31</p>	<p><u>CHSP</u></p> <p><u>BT, ST</u></p>
<p>Columbia River</p> <ul style="list-style-type: none"> - mouth to Snake River - Snake River to Priest Rapids Dam - above Priest Rapids Dam 	<p>November 1 - February 28</p> <p>August 1 - August 31</p> <p>July 1 - August 31</p>	All Columbia River tributaries	See county listings	
Snake River	August 1 - August 31	All Snake River tributaries	See county listings	

ALLOWABLE IN-WATER WORK WINDOWS FOR FRESHWATER				
General Season ¹ by County		Exceptions to General Season ²		
County / Watershed	Activity Is Allowed Only Between These Dates	Stream and All Tributaries, Unless Otherwise Listed ²	Activity Is Allowed Only Between These Dates	Species Protected ⁴
Lakes ³ - Non-salmonid bearing - Eastern WA - Western WA - Salmonid bearing	March 15 - April 15 June 10 - April 1 July 16 - April 30 February 28 July 1 - August 15	See county listings	See county listings	

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
1 (Shelton): All saltwater areas in Oakland Bay and Hammersley Inlet westerly of a line projected from Hungerford Point to Arcadia.	June 15 - March 14	None		Juvenile Salmonids
	—	—		Surf smelt
	April 1 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
2 (Olympia): All saltwater areas between a line projected from Hungerford Point to Arcadia and a line projected from Johnson Point to Devil's Head. This includes Totten, Eld, Budd, Case and Henderson Inlets, and Pickering Passage.	June 15 - March 14	None		Juvenile Salmonids
	April 1 - June 30	None		Surf smelt
	April 1 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
3 (South Puget Sound): All saltwater areas easterly and northerly of a line projected from Johnson Point to Devil's Head and southerly of the Tacoma Narrows Bridge.	June 15 - March 14	None		Juvenile Salmonids
	May 1 - September 30	None		Surf smelt
	April 1 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
4 (Tacoma): All saltwater areas northerly of the Tacoma Narrows Bridge and southerly of a line projected true west and true east across Puget Sound from the northern tip of Vashon Island.	June 15 - March 14 April 15 - September 30 April 15 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
5 (Seattle): All saltwater areas northerly of a line projected true west and true east across Puget Sound from the northern tip of Vashon Island and southerly of a line projected true east from Point Jefferson at 47° 15' N. latitude across Puget Sound. This area includes Port Orchard, Port Madison, and Dyes and Sinclair Inlets.	June 15 - March 14 April 1 - August 31 May 1 - January 14 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None - Eagle Harbor - Sinclair Inlet None None None None None	Year round Year round	Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
6 (Edmonds): All saltwater areas northerly of a line projected true east from Point Jefferson at 47° 15' N. latitude across Puget Sound and southerly of a line projected true east from Possession Point to Chenault Beach and from Foulweather Bluff to Double Bluff.	June 15 - March 14 April 15 - September 30 — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None — — None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
7 (Everett): All saltwater areas northerly of a line projected true east from Possession Point to Chenault Beach, easterly of a line projected 5° true from East Point to Lowell Point, and southerly of the Stanwood to Camano Island Highway. This area includes Port Gardner, Port Susan, and parts of Possession Sound and Saratoga Passage.	June 15 - March 14 Year round April 15 - January 31 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
8 (Yokeko Point): All saltwater area westerly and northerly of a line projected 5° true from East Point to Lowell Point, north of the Stanwood to Camano Island Highway, and easterly and southerly of Deception Pass Bridge and the Swinomish Channel Bridge on State Highway 536. This area includes Holmes Harbor, Saratoga Passage, Skagit Bay, Similk Bay, and most of the Swinomish Channel.	June 15 - March 14 Year round April 15 - January 31 March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None None None None None None		Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout
9 (Blaine): All saltwater area in Skagit County and Whatcom County that lies northerly of the Swinomish Channel Bridge on State Highway 536 and westerly and northerly of Deception Pass Bridge.	June 15 - March 14 Year round — March 2 - October 14 April 1 - December 14 October 15 - May 14 July 2 - January 31	None None - South of a line running due west from Governor's point - North of a line running due west from Governor's point None None None None	April 15 - January 31 June 15 - January 31	Juvenile Salmonids Surf smelt Pacific herring Pacific sand lance Rock sole Lingcod Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS

Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
10 (Port Townsend): All saltwater area of Puget Sound as defined in WAC 220-16-210 except Hood Canal south of a line projected from Tala Point to Foulweather Bluff, and except all waters defined in Tidal Reference Areas 1 through 9. Area 10 includes waters of the San Juan Islands, Admiralty Inlet, the Strait of Juan de Fuca, and associated bays and inlets.	June 15 - March 14	None	November 1 - September 14 January 15 - October 14 September 1 - April 30 September 1 - April 30 Year round	Juvenile Salmonids
	—	- Kilisnoe Harbor - Dungeness Bay - Twin Rivers - Deep Creek - San Juan Islands		Surf smelt
	May 1 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		
11 (Union): All saltwater area of Hood Canal southerly and easterly of a line projected from Lilliwaup Bay to Dewatto Bay.	June 15 - March 14	None		Juvenile Salmonids
	March 2 - September 14	None		Surf smelt
	April 1 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
12 (Seabeck): All saltwater areas of Hood Canal northerly of a line projected from Lilliwaup Bay to Dewatto Bay and southerly of a line projected true east from Hazel Point. This area includes Dabob Bay and Quilcene Bay.	June 15 - March 14	None		Juvenile Salmonids
	—	—		Surf smelt
	April 15 - February 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
13 (Bangor): All saltwater area of Hood Canal northerly of a line projected true east from Hazel Point and south of a line projected from Tala Point to Foulweather Bluff. This area includes Port Gamble.	June 15 - March 14	None		Juvenile Salmonids
	February 1 - October 14	None		Surf smelt
	April 15 - January 14	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
14 (Ocean Beaches): All saltwater area between Cape Flattery and the Oregon border at the mouth of the Columbia River, excluding Grays Harbor and Willapa Bay.	June 15 - February 28	None		Juvenile Salmonids
	—	—		Surf smelt
	—	—		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
15 (Westport): All saltwater area in Grays Harbor easterly of a line projected from the outermost end of the north jetty to the outermost end of the south jetty, and westerly of 123° 59' W. longitude.	June 15 - February 28	None		Juvenile Salmonids
	—	—		Surf smelt
	—	—		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout

ALLOWABLE IN-WATER WORK WINDOWS FOR MARINE WATERS				
Tidal Reference Area	General Season Activity Is Allowed Only Between These Dates	Exceptions to General Season ²		
		Exception	Activity Is Allowed Only Between These Dates	Species Protected
16 (Aberdeen): All saltwater area in Grays Harbor easterly of 123° 59' W. longitude and westerly of the Union Pacific railroad US HWY 101 bridge across the Chehalis River. NOTE: The RR bridge is no longer there.	June 15 - February 28	None		Juvenile Salmonids
	—	—		Surf smelt
	—	—		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout
17 (Willapa Bay): All saltwater area in Willapa Bay easterly of a line projected from Leadbetter Point to Cape Shoalwater Light.	June 15 - February 28	None		Juvenile Salmonids
	—	—		Surf smelt
	March 15 - January 31	None		Pacific herring
	March 2 - October 14	None		Pacific sand lance
	April 1 - December 14	None		Rock sole
	October 15 - May 14	None		Lingcod
	July 2 - January 31	None		Bull trout (present?)

1. The General Season for a county applies to all streams within that county, **unless** a specific season is given for a listed stream in that county under Exceptions to the General Season. Some streams flow through multiple counties. Check the listing for the county in which you propose to work to determine the open season for that stream.
2. The season for a listed Exception to the General Season applies to **all** its tributaries, **unless** a tributary of that stream is also listed with a separate season. Such tributaries are listed below the parent stream with and indent and a (-). Some streams flow through multiple counties. Check the listing for the county in which you propose to work to determine the open season for that stream. ????????????? means either a separate or supplemental HPA is required.
3. Columbia and Snake River reservoirs are **not** considered lakes. Lake is defined in WAC 220-110-020(47) as any natural or impounded body of standing freshwater, except impoundments of the Columbia and Snake Rivers. Timing applies as noted, except where specific timing by county indicates otherwise.
4. Species Protected: Species listed provide the primary basis for timing guidelines. The species list should be considered general information and is not comprehensive.
5. Proposed changes from staff did not include justification for the change. Justification required to finalize change.

BT - bull trout
 CHF - fall chinook salmon
 CHS - summer chinook salmon

CT - cutthroat trout (includes sea run)
 SO - sockeye salmon
 STS - summer steelhead

CHSP - spring chinook salmon
CO - coho salmon
CM - chum salmon

STW - winter steelhead
T - various other species of trout
WW - various warm water game fish

Drift